

**INFORMATION TECHNOLOGIES, TELECOMMUNICATIONS
AND E-COMMERCE MARKET OPPORTUNITIES
FOR U.S. SMALL AND
MEDIUM-SIZED BUSINESSES**

ExportIT Mexico

**U.S. DEPARTMENT OF COMMERCE
International Trade Administration
Trade Development
Information Technology Industries**



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FOREWORD

This report describes and analyzes the trends, key issues, and events in information technology, telecommunications, Internet and e-commerce adoption in Mexico, to create a framework from which U.S. small- and medium-sized enterprises (SMEs) can make educated business decisions about entering these markets. The report analyzes the status of telecommunications liberalization, competition in telecommunications services, the deployment of new technologies, and how these changes are affecting the adoption of the Internet and e-commerce. It also analyzes economic, cultural, and political factors influencing the adoption of information, Internet and e-commerce technologies. The report highlights market opportunities relevant to U.S. SMEs in the telecommunications, information technology (IT) and e-commerce areas. And the report provides suggested market entry strategies for SMEs, U.S. Department of Commerce and other resources to assist U.S. firms in market entry endeavors, and contacts in the United States and Mexico.

The report is based on market research and analysis undertaken in Mexico in September 2001 by international trade specialists from the Information Technology Industries unit of Trade Development within the Commerce Department's International Trade Administration (ITA): Steve Green and Richard Paddock with the Office of Telecommunications Technologies, Robin Gaines with the Office of Information Technologies, and Arrow Augerot with the Office of Electronic Commerce. They interviewed software, Internet and telecommunications equipment and services producers, trade associations, industry analysts, and government officials in Mexico City, Mexico. The work was actively supported by market specialists in ITA's Commercial Service (US&FCS) in Mexico. Information gathered from on-site interviews is supplemented with data from market research firms and a review of available literature.

EXECUTIVE SUMMARY

This report is part of the International Trade Administration's *ExportIT Market Research* series designed to provide U.S. small- and medium-sized enterprises (SMEs) in the telecommunications, information technology (IT) and e-commerce sectors with timely, affordable information. The report will provide an overview of the Mexican market for these products and services. It will also provide a framework by which to judge the potential for conducting business in a country that is a major U.S. trading partner and in which the government and the private sector have realized the critical nature of telecommunications and IT to economic growth and global competitiveness. The uptake of these technologies is and will continue to be rapid and as broadly based as investment funds and personal income will allow.

Telecommunications

With a population of over 100 million inhabitants, Mexico's telecommunications equipment and services markets have considerable growth potential, due largely to relatively low fixed-line teledensity and resultant pent-up demand. Privatization and pro-competitive measures first announced in 1989 significantly pared back the Government of Mexico's (GOM) role in the telecom sector. Many of these measures were codified in the 1995 Federal Telecom Law (FTL), which was introduced to replace a law governing the telecom sector dating back to the 1940s. The FTL allowed new entrants into the market to compete with Telmex. It opened every telecom service up to competition, allowed higher levels of

foreign participation, and mandated interconnection and transparent as well as non-discriminatory processes for licensing. More recently, the regulatory authority COFETEL issued regulations designed to curb Telmex's monopolistic practices and force the carrier to move toward cost-based tariff structures.

Despite numerous advances on paper, the regulatory environment in Mexico today is widely viewed as a drag on the country's telecom market. In the late 1990s, the GOM moved haltingly to implement pro-competitive measures and, despite commitments from the Fox Administration, regulators have taken few steps over the last year to reign in Telmex. Industry observers note that most regulators simply refused to take public positions against Telmex or use regulatory tools at their disposal. Even when, in late 2000, COFETEL found Telmex to be in violation of certain requirements outlined in the regulations, Telmex challenged the regulator's authority in court and won a temporary suspension of COFETEL's asymmetric regulations.

Since the late 1990's, Mexico has been consistently identified in the U.S. Trade Representative's (USTR) 1377 Report to Congress as a country with insufficient competitive safeguards in its telecom market. On February 13, 2002, the USTR announced that it would request a World Trade Organization (WTO) dispute resolution panel in Geneva to rule on what the U.S. views as significant violations of Mexico's WTO commitments in the telecommunications sector. USTR Robert B. Zoellick said the U.S. has requested the

WTO dispute settlement panel because bilateral efforts to open Mexico's market to foreign competition have stalled.

On the legislative front, Mexico's Congress is presently in the early stages of discussing a draft telecom reform law that it hopes to pass by September 2002. A lack of action by the GOM to address these issues would have detrimental effects on Mexico's telecom sector, including discouraging higher levels of foreign investment. In addition, the growth of Mexico's fledgling broadband service sector could be severely restricted if Telmex is not subject to strong regulation to promote competition.

At year-end 2000, basic telephony and data communications services in Mexico combined to generate revenues of roughly \$8.1 billion. Local telephony was the largest segment of the market, accounting for 58 percent of revenues. New entrants to the fixed communications marketplace are expected to invest most heavily in the local telephony sector, especially given certain Telmex policies that increase the attractiveness of specific market niches, such as not investing in areas where demand for telephone lines is less than 2,000. As transmission of data becomes increasingly crucial to the corporate sector, the segment with greatest room for growth in the next five years will likely be data communications. This should increase demand for bundled packages of services and spur investment in end-to-end technologies that enhance the competitiveness of new entrants' offerings.

Additionally, demand for telecom equipment is sure to increase over the next five years, as both residential and corporate

clients drive telecom operators to upgrade their networks to take advantage of higher-speed technologies that maximize the potential of the Internet.

Significant changes are expected to accompany rapid growth in the wireless market over the next few years as competition heats up and operators consolidate their holdings in the market. In addition to shifting their focus to lower-income segments of the population, wireless operators are expected to target corporate segments with high-end, high-tech applications as the further introduction of advanced technologies gradually permits new mobile services.

Information Technology

The information technology (IT) sector in Mexico has developed at an impressive rate over the last few years. According to International Data Corporation (IDC), the compound annual growth rate from 2001 to 2005 is expected to be 7 percent. Growth in this sector is expected to continue, as several programs established by both the public and private sectors take effect to stimulate the use of IT throughout the economy. Computer hardware continues to dominate Mexican IT expenditures, accounting for 59 percent of IT expenditures in 2001, with personal computers accounting for 62 percent of hardware sales. Demand for computers continues to grow in all segments, particularly in the small businesses and home use markets.

The market for PCs in Mexico is highly competitive with all the major manufacturers competing for market share. The biggest impediment to increased PC use

is an annual average income of about \$5,000 per year. Manufacturers and retailers have developed several strategies to increase demand and provide financing options in order to increase sales. As more PCs are purchased through creative financing plans and innovative marketing techniques, IT adoption will move further down the socio-economic ladder.

The software market in Mexico is very competitive, with most major U.S. and other foreign software developers selling in the market. More than 90 percent of packaged software sold in Mexico is imported, mainly from the United States. In contrast to packaged software, more than 90 percent of customized software is developed in Mexico. Although the Mexican software market can be a lucrative one for U.S. firms, Mexico's software piracy rate can pose problems for software suppliers. Sales of software in Mexico were \$632 million in 2001 and are expected to decline slightly in 2002 and remain flat over the next two years.

The Internet

The Mexican Internet penetration rate was approximately 3 percent in 2001 and the number of Internet users are expected to grow rapidly during the next three years. Faster Internet uptake is being limited by a low PC penetration rate and a lack of fixed line capacity which prevents potential customers from gaining access. Although potential Mexican Internet users may be limited to 20 to 25 percent of the Mexican population, due to income distribution patterns, Mexico still provides a potentially lucrative market of at least 20 million people. Barriers to Internet use will, in the

short-term, mean that Internet access will be limited to larger companies, educational institutions, and a small base of home users. However, U.S. companies will still find ample opportunities for both investment and sales in Mexican Internet-related products and services.

Over the long-term, Internet use is expected to increase as the process of technology diffusion continues, moving from larger companies to their suppliers, from institutions of higher education down to secondary and primary schools, and from the Mexican federal government out to local governments. Most Internet accounts will remain dial-up rather than broadband through 2005 according to Pyramid Research. Wireless Internet use may become more widespread in the future as a result of the serious infrastructure problems with the fixed line Internet.

The relatively fast expansion of the Internet in Mexico, growing interest in e-commerce, and increasing use of business applications are creating a need for hosting services with large storage capabilities. Companies that are capable of offering bundled packages of connectivity, hosting, and storage will eventually displace companies currently offering simple co-location and basic storage solutions for Web sites.

E-Commerce

E-commerce in Mexico is expected to reach approximately \$38 billion by 2005, up from US\$1.2 billion in 2001, making it a leader in Latin America in terms of potential for future growth in this area.

Currently, business-to-business (B2B) is

more prevalent than business-to-consumer (B2C) e-commerce. In 2000, B2B accounted for 77 percent of the total transactions in Mexico. B2C accounted for the remaining 23 percent of e-commerce in 2000. The main issues affecting B2C e-commerce include: low Internet access rate; small consumer purchasing power; problems associated with credit cards and the banking system; and educational and awareness issues.

Despite fears that the recent decline in the Mexican economy will have a long term impact on Mexico's e-commerce market, most signs indicate that B2B will adjust quickly to the economic downturn and will continue to thrive, as an increasing amount of resources are invested in the development of online supply chains by both the private sector and the Government of Mexico. In fact, B2B is projected to reach 84 percent of the e-commerce market by 2005. This growth will also result from declines in B2C transactions that are likely to occur in both the short- and medium-term. However, as the Internet penetration rate continues to grow, so will B2C, and a more equitable distribution between B2B and B2C e-commerce is likely in the long-term.

One of the most promising developments related to Mexico's e-commerce future is the GOM's new commitment to making Mexico a true digital economy. The development of the E-Mexico program is the most obvious manifestation of this commitment. E-Mexico's main goals are to develop Mexico's IT industry; foster an internal market for IT products; promote an adequate regulatory framework in the use of electronic media and e-commerce; and digitalize government services in order to

create a model for the private sector. Leaders of E-Mexico claim that by 2025, 98 percent of Mexican citizens will be online, IT and Internet education will be available in all schools, and the legal and regulatory structure for e-commerce will promote greater consumer confidence, including the use of credit cards for online transactions.

Another positive development in this area is the work that is being done on the e-commerce legal and regulatory structure. Both the private sector in Mexico and the GOM are extremely committed to revamping laws that pertain to, or affect, e-commerce. In 2000, the GOM began this undertaking with the passage of four amendments to existing laws—referred to as the E-Commerce Law 2000—resulting in the following: electronic contracts are recognized legally; information transmitted online will stand up in judicial proceedings; and, consumer protection laws cover the online world.

While the E-Commerce Law 2000 was a very productive beginning, a number of additional laws and regulations have been proposed to make Mexico's laws related to e-commerce "inter-operable" with other digital economies. Perhaps the most important is the "e-invoice" legislation, which will eliminate the requirement that businesses provide hard copies of invoices in electronic transactions. This requirement is widely viewed as a burden on industry, and especially on SMEs that lack the resources to deal with maintaining both an electronic and paper system of record-keeping.

Additional legislation related to digital signatures, consumer protection, data

privacy, and intellectual property rights are pending in the Mexican Congress. Some experts are concerned that the GOM's interest in passing laws related to e-commerce may be too zealous--and that some of the specific provisions, such as those related to data privacy, could end up being more of a hindrance than a benefit to the GOM's goal of transforming Mexico into a digital society. It is widely felt that the extent to which proponents of the free flow of information and a self-regulatory approach prevail on these issues, the evolution of B2B and B2C e-commerce in Mexico will be advanced.

TERMS & ABBREVIATIONS

\$	Unless otherwise noted, dollar figures cited in the report are U.S. dollars
2G	second generation
3G	third generation
ADSL	asynchronous digital subscriber line
AMIPSI	Mexican Internet Advertising Association
AMITI	Mexican Association of Information Technology Industries
AMPS	advanced mobile phone service
APEC	Asia Pacific Economic Cooperation
ARPL	average revenue per line
ARPS	average revenue per subscriber
ARPU	average revenue per unit
ASPs	application service providers
B2B	business-to-business
B2C	business-to-consumer
BTA	Agreement on Basic Telecommunications Services
CAGR	compound average growth rate
CAP	competitive access providers
CDPD	cellular digital packet data
CDMA	code division multiple access
CLEC	competitive local exchange carrier
CM	Contract manufacturer
COFETEL	Federal Telecommunications Commission
COD	cash on delivery
CPP	calling party pays
DECT	digital enhanced cordless telecommunications
DLD	domestic long distance
EDI	electronic data interchange
FCC	Federal Communications Commission
FDI	foreign direct investment
FMC	fixed/mobile convergence
FTL	Federal Telecommunications Law
FTAA	Free Trade Agreement of the Americas
FWA	fixed wireless access

TERMS & ABBREVIATIONS—continued

GATS	General Agreement on Trade in Services
Ghz	billion cycles per second
GPRS	general packet radio service
GPS	global positioning system
GSM	global system for mobile communications
GOM	government of Mexico
HDSL	high bit rate digital subscriber line
ILD	international long distance
ICT	information and communications technologies
IDC	International Data Corporation
IDEN	Integrated Digital Enhanced Network
IFACs	Industry Functional Committees on Trade Policy Matters
IMF	International Monetary Fund
ISA	industry sector analysis
ISDN	integrated services, digital network
ISACs	Industry Sector Advisory Committees
ISP	Internet service providers
IT	information technology
ITA	Information Technology Agreement
ITA	International Trade Administration
ITU	International Telecommunications Union
LMDS	local multipoint distribution system
MEP	minimum estimated prices
MFN	Most Favored Nation
MMDS	multipoint multichannel distribution system
MSO	multi-service operator
MOU	minutes of use
NTDB	National Trade Data Bank
OECD	Organization for Economic Cooperation and Development
OETCA	Office of Export Trading Company Affairs

TERMS & ABBREVIATIONS—continued

PDA	personal digital assistant
PPP	public-private partnership
PC	personal computer
SCT	Secretariat of Communications and Transportation
SMR	special mobile radio
SME	small and medium-sized enterprise
SMS	short message service
TDMA	time division multiple access
TELMEX	former Mexican telephone monopoly
UMTS	universal mobile telecommunications system
USEAC	U.S. Export Assistance Centers
USTR	Office of the U.S. Trade Representative
VAS	value added services
VAT	value-added tax
VOIP	voice over Internet protocol
VSAT	very small aperture terminal
WAP	wireless application protocol
WLL	wireless local loop
WTO	World Trade Organization
Y2K	Year 2000

CHAPTER 1: OVERVIEW OF THE MEXICAN TELECOMMUNICATIONS, INFORMATION TECHNOLOGY AND E-COMMERCE MARKETS

THE MEXICAN ECONOMIC ENVIRONMENT

The U.S. and Mexican economies are very interdependent. Because of the strong trading relationship, the Mexican economy suffers along with the U.S. economy when the United States is in recession. The Mexican economy grew at 7 percent during 2000, but projections for 2001 have dropped from growth of 5.5 percent to a decline of 0.3 percent. The economy is expected to rebound modestly in 2002, with estimates ranging from a GDP growth of between 0.8 percent to 2.2 percent.

One factor hindering faster growth in the Mexican economy is that the Mexican banking system is generally weak and undercapitalized, and interest rates are very high, according to the *Mexico Country Commercial Guide for FY 2002*. As a result, only about 36 percent of Mexican companies use or have access to bank financing. Therefore, the economic expansion that has occurred since the 1994-95 peso crisis has mostly benefitted larger companies with access to foreign credit. Currency fluctuations over the last three years between the Mexican peso and the U.S. dollar have been as much as 10 percent, sometimes causing payment difficulties for Mexican buyers. However, the Mexican peso currently is very strong against the dollar.

Meanwhile, many other suffering Latin

American economies have increased Mexico's position as an attractive investment location. Inflation was 9 percent in 2000, and the Mexican government (GOM) had projected an inflation rate of 6.5 percent for 2001 that is now expected to be 4.4 percent, below the original target. The GOM has implemented strong fiscally conservative programs that have further bolstered investor confidence.

With a population of approximately 100 million and close to half of this total living in poverty, the ability to increase the use of telecommunications, information technology and e-commerce may be limited. Approximately 20 percent of the population accounts for 85 to 90 percent of GDP, and GDP per capita is \$5,000.

Access to technology and the ability to use it varies by region within Mexico. Generally, educational levels are higher in urban areas than in rural areas. Although the literacy rate is relatively high, there are currently low numbers of Mexicans with college or higher level degrees in high technology areas. In 2000, about 90 percent of the Mexican population could read and write and the average educational level was 7.6 years. Therefore, U.S. firms seeking to do business or establish an operation in Mexico may need to provide comprehensive training programs in order to secure a qualified technical workforce.

TELECOMMUNICATIONS SECTOR

The Mexican telecommunications market has grown four times faster than the economy as a whole during the last eight years. The size of the combined market for equipment and services is estimated to exceed \$5 billion yearly over the next three years. The low level of basic telecom penetration in Mexico shows the tremendous potential for growth in the market. Although growth in the cellular market has been explosive, the penetration levels are still low, at 12.8 percent for fixed lines and 13.5 percent for wireless.

In the past year, the Mexican market experienced tremendous growth in certain areas. Between 1999 and 2000, the number of cellular users grew by 82 percent, totaling more than 14 million users. By December 2001, the number of cellular users increased to 18.5 million. This has caused persistent saturation of the networks, resulting in consumer dissatisfaction and pent-up demand for services. As a result, the Mexican telecommunications authority COFETEL has required the concessionaires to upgrade the capacity of their networks and established several other mandates aimed at improving customer satisfaction.

Another area of impressive growth is local telephony and the use of wireless technology as the best alternative to achieve higher teledensity. New local operators in the next two years will install more than one million fixed wireless lines. Additionally, cable TV penetration is estimated at 3 percent. The cable TV market has grown at an average annual rate of 12 percent during the last four years and is expected to continue growing, as cable is increasingly

used for voice and data services.

The Mexican Federal Telecommunications Commission (COFETEL) states that telecom sector investment in 2001 reached \$7.25 billion dollars, of which \$4.69 billion was used to increase teledensity and improve telephone service. Other important areas of investment included subscriber television (\$380 million), paging and trunking (\$270 million), and satellite services (\$115 million).

The United States continues to be the largest single supplier of telecommunications equipment to Mexico, with U.S. exports to Mexico growing 31 percent in 2000 (\$2.85

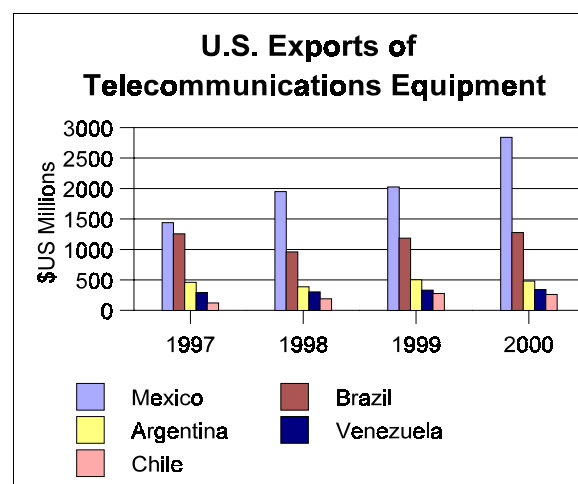


FIGURE 1-1. Source: U.S. Department of Commerce, Bureau of Census; definition by Office of Telecommunication Technologies; derived from USITC database

billion), more than double the amount sent to Brazil (\$1.28 billion), the second largest importer of U.S. telecom products. The U.S. share of Mexican imports was 73 percent in 1999. However, the market share declined to 60 percent in 2000. This is a

result of market share gains by Asian and European producers.

U.S. products continue to have several advantages over other countries, such as geographical proximity, allowing for shorter delivery times and lower transportation costs, and the perception that U.S. manufacturers have a technological edge. However, the recently signed free trade agreement with the European Union has already begun to benefit European competitors by providing them similar tariff considerations as U.S. products.

INFORMATION TECHNOLOGY SECTOR

Mexico is the second largest market for IT products in Latin America, after Brazil. According to International Data Corporation (IDC), the size of the IT market in Mexico is projected to reach \$6.2 billion in 2001 (excluding wide area network (WAN)

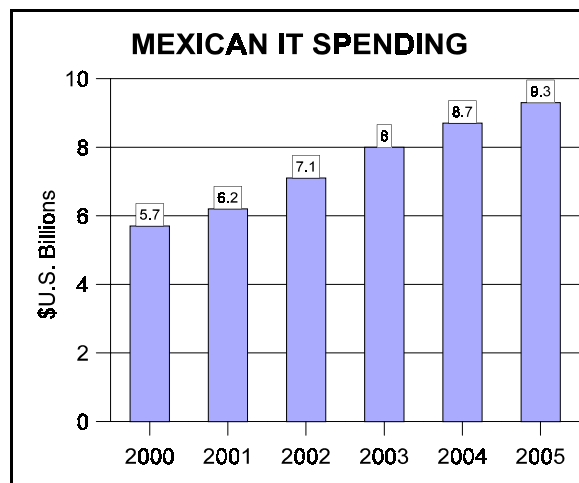


FIGURE 1-2. Source: International Data Corp. (IDC), 12/01

equipment). However, due to slower than projected growth in the Mexican economy,

the overall IT growth rate between 2000 and 2001 may range between 3.3 and 5.8 percent, instead of the 8.7 percent depicted in FIGURE 1-2. Market growth projections are dependent on several factors including fallout from the bust of the dot coms and effects on the U.S. economy following the September 11 attacks. The Mexican telecommunications sector has been less affected by Mexico's economic slowdown than the IT sector. The computer sector has been hardest hit, with personal and business purchases of IT hardware being delayed.

Factors Affecting Diffusion of Technology

The diffusion of computer technology has been rapid since the liberalization of the computer market in the early 1990s. It was further advanced through benefits from the North American Free Trade Agreement (NAFTA), including lower prices, increased investment and more competition for formerly protected domestic Mexican industries. However, there has not been a cohesive Mexican information technology policy until Mexico's President Fox announced his "E-Mexico" program in June 2001. Lack of a national commitment to increasing the use of technology and a lack of funding for such a program has led to slower uptake of computer and Internet use than would have occurred otherwise. Under a more coordinated effort, such as E-Mexico, there seems to be a growing impetus to develop the infrastructure and human resources necessary to bring Mexico into the digital age.

Central to the problem of faster Mexican adoption of computer, Internet and e-commerce use are the lack of complete liberalization of the telecommunications

sector, remaining restrictions on foreign investment in this sector, and the resulting near monopoly position of Telefonos de Mexico (Telmex), the formerly government-owned telecom provider. Telmex owns most of the telecom infrastructure and therefore controls most of the Mexican telecommunications services market. Although there are now some local competitors of Telmex in the fixed wire area, they are generally undercapitalized and forced to serve areas in which Telmex has no interest. There is an immediate need for additional capacity to fulfill growing demand for fixed-wire services. Demand for these services is being driven by economic growth and growing demand for Internet connections.

There are other factors inhibiting growth in IT and e-commerce. For instance, there are 12.5 telephone lines per 100 people, a teledensity lower than Argentina, Brazil, Chile, Colombia and Uruguay. There are only 5.1 computers per 100 persons, placing Mexico fourth in computer penetration after Brazil, Uruguay and Argentina in rank order, according to the International Telecommunications Union's (ITU), *Internet Indicators* (www.itu.int). Without increased teledensity and computer use, Internet access and, therefore, e-commerce applications will remain limited.

Mexicans are open to new technology, especially if they can afford it. Businesses need to be convinced that IT will make them more productive before they will make new investments in it. Upgrades of computers and new software will be difficult to sell when companies have to make difficult decisions with limited funding. Small and medium-sized enterprises (SMEs), as well

as consumers, have limited access to bank credit and end up relying on alternate sources of credit. However, the Mexican market for computer equipment continues to grow as demand increases, driven by falling prices, supplier financing plans, and various private sector and government programs aimed at increasing the use of information technology.

General Structure of the Computer Hardware, Software and Internet Industries

The computer hardware and software sectors are represented by all the major players, mainly foreign companies, mostly from the United States and Asia. Computers are both domestically produced and imported, whereas a majority of software is imported. More software is being customized for the Mexican market in Mexico than previously. Mexican Internet service providers (ISPs) include foreign and domestic firms, with Telmex's partner, Prodigy having more than a 50 percent market share.

U.S. Exports

U.S. exports of computer equipment (including peripherals) for 2000 were worth \$1.9 billion, up 38 percent over their level in 1999 (see FIGURE 1-3). Mexico is by far the largest market for U.S. exports of these products in the Latin America region, accounting for close to 47 percent of the regional total. Through the first nine months of 2001, U.S. exports of computer equipment increased 3 percent over the same period in 2000 due to the current economic situation in Mexico.

Based on Mexican data, U.S.-origin computer equipment (including systems, monitors, laser, ink jet and dot matrix printers and scanners) accounts for a large

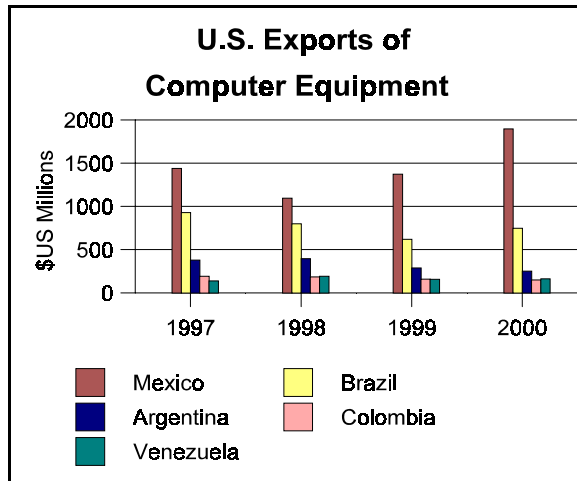


FIGURE 1-3. Source: U.S. Department of Commerce, Bureau of Census; definition by Office of Information Technologies; derived from USITC database.

portion of Mexican imports of these products. For example, the U.S. share of computers and peripherals imported was 74.7 percent of total imports in 2000. Figures as of November 2001 show a 72.8 percent U.S. market share.

U.S. exports of software to Mexico were \$117 million in 2000 (U.S. Department of Commerce, Bureau of Census), up 31 percent over the 1999 value of \$89 million. These figures do not reflect total software exports because there is no way to capture software traded electronically or pre-loaded on computers sold in Mexico. Mexico is the largest market in Latin America for exports of U.S. software.

E-COMMERCE

The Mexican e-commerce market leads Latin America in terms of potential for future growth. Most indicators suggest that both B2B and B2C will continue to grow in the long term, despite short term set backs predicted as result in the downturn of the Mexican economy. In fact, e-commerce in Mexico is expected to reach approximately \$38 billion by 2005, up from \$1.2 billion in 2001.¹

B2B e-commerce is more prevalent now, and has greater prospects for future growth, than business to consumer (B2C) transactions in Mexico. In 2000, B2B accounted for 77 percent of the total transactions in Mexico, and by 2005 it is estimated that it will reach 84 percent.² Efforts by large Mexican companies, multinational corporations, and the Mexican Government, through E-Mexico, to build online supply chains will contribute to future success in this area and will broaden B2B to include more SMEs.

Even though Mexico ranks second in Latin America in percentage of people who shop online, B2C made up only 23 percent of total revenue generated by e-commerce in Mexico in 2000, and this number is predicted to decline as long as the problems

1. Pyramid Research, "Communications Markets in Mexico: Blurring Barriers and Escalating Competition", (Economist Intelligence Unit, Ltd.) July 2001, p. 113.

2. Pyramid Research, "Communications Markets in Mexico", (EIU, July 2001) p. 113.

with the Mexican economy continue.³ The main issues affecting B2C include: Internet access issues, small consumer purchasing power, problems associated with credit cards and the banking system, and educational and awareness issues.

The E-Mexico program will address some of these issues by focusing on developing Mexico's IT industry, foster an internal market for IT products, promoting an adequate regulatory framework in the use of electronic media and e-commerce, and to digitalizing government services. Leaders of E-Mexico claim that by 2025, 98 percent of Mexican citizens will be online, IT and Internet education will be available in all schools, and the legal and regulatory structure for e-commerce will promote greater consumer confidence, including in the use of credit cards online.

In 2000, the Mexican government began reforming its regulatory structure to facilitate e-commerce. With the passage of the E-Commerce Law 2000, electronic contracts are now recognized; information transmitted online will stand up in judicial proceedings; and, consumer protection laws were extended to cover the online world.

Additional legislation related to digital signatures, e-invoice, consumer protection, data privacy, and intellectual property rights are pending in the Mexican Congress. The extent to which proponents of the free flow of information and a self-regulatory approach prevail on these issues will

determine the future of e-commerce in Mexico.

INTERNATIONAL TRADE

Under NAFTA, U.S. exports of electronic computer equipment are duty-free when exported to Mexico, if they meet the rule of origin requirement. (For specific questions on rule of origin requirements for a product, please contact the U.S. Customs Web site at www.customs.treas.gov, select "importing and exporting" and scroll down to International Agreements.) Duties assessed on telecommunications products continue to fall and a significant number of products now enter Mexico duty-free. Duties on all IT-related products will be eliminated as of January 1, 2004.

Mexico currently has a liberal trade regime after years of trying to limit imports in order to foster the development of domestic industries. Implementation of NAFTA opened up some sectors of the Mexican economy to competition from U.S. companies and increased their use of IT as a competitive tool in the economy. As a result, many U.S. firms, such as HP and IBM, have increased their Mexican production and captured a large share of increased investment in IT that took place after the peso crisis of 1994-95. Mexico has benefitted from this IT investment through lower prices for computer hardware, which has improved productivity in the manufacturing and services sectors, stimulated job creation, and encouraged the

3. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001.

transfer of advanced manufacturing technologies.⁴

Mexico has initiated many programs in order to make the country an attractive investment location. Two such programs, the *maquila* program and the Temporary Importation Program to Produce Articles for Export or PITEX, both implemented before NAFTA, have had a major impact on investment. Most computer, telecommunications, and electronics companies producing in Mexico operate under one of these plans. Both plans allow duty-free importation of parts and components when they are used in products that are exported (similar to the U.S. Foreign Trade Zone program). Under the *maquila* program, if the product is sold in the domestic Mexican market, duties are charged only on the foreign content in the product. Once a product is imported from Mexico into the United States from a *maquiladora* operation, and if that product was assembled from U.S. components, U.S. duties are charged only on the value-added of the assembly process.

Many technology-related companies have used the *maquila* program over the years to cut operating costs, not only through lower wages, but also through having a more stable workforce with less turnover. In general, many manufacturing processes that take place in a *maquila* plant are low-value added, labor intensive processes. However, since the implementation of NAFTA, some

of these operations are moving up the value-added scale.

Prior to NAFTA, *maquiladora* operations were not at all integrated into the rest of the Mexican economy. NAFTA provisions slowly integrated these operations into the Mexican economy by eliminating export performance requirements and limitations on how much output from a *maquila* operation could be sold directly into the Mexican market. The tax advantages of the PITEX program are also being phased out as the provisions of NAFTA are fully phased in. Since NAFTA, many U.S. companies have integrated their Mexican plants into their global operations rather than treating them as simply assembly operations.

Many U.S. and other foreign firms are using their Mexican operations to access not only the Mexican market, but also the many other countries which benefit from liberal trading relationships with Mexico, especially other countries in Latin America. Anecdotal evidence suggests that there is approximately a 5 percent cost advantage when Latin American countries are supplied from Mexican production rather than U.S. production as a result of Mexico's trade agreements. The following chart lists countries and regions with whom Mexico has trade agreements.

Negotiations for preferential trade arrangements are underway with Panama and the European Free Trade Association (Norway, Switzerland, Iceland and Liechtenstein). Mexico is also actively participating in the Asian-Pacific Economic Cooperation (APEC) and in the market liberalization programs APEC is considering. In addition, Mexico is

4. *Impacts of Economic Integration on the Computer Sector in Mexico and the United States*, Jason Diedrick, Kenneth L. Kraemer, University of California, Irvine & Juan J. Palacios, University of Guadalajara, 1999.

MEXICO'S TRADE AGREEMENTS			
United States*	Bolivia*	European Union*	Honduras**
Canada*	Costa Rica*	Israel**	El Salvador**
Colombia*	Chile*	Uruguay**	
Venezuela*	Nicaragua*	Guatemala**	

Source: Secretaria de Economia, Government of Mexico

*Countries with whom Mexico has a free trade agreement; **Countries with whom Mexico has other trade agreements

participating in the Free Trade Area of the Americas (FTAA) currently under negotiation.

Mexico is not a signatory to the Information Technology Agreement (ITA). Many electronics firms, including manufacturers of pagers, printers and cell phones that are located in the State of Jalisco, which is gaining a reputation as the “Silicon Valley of the south,” would like the GOM to join the ITA. Joining the ITA would result in tariff-free movement of high-tech components, which U.S. and foreign companies believe would allow them to be more flexible in the use of sub-contractors. Increasing use of sub-contractors aids in a company’s ability to shift the focus of production faster, either from lower-tech goods to more sophisticated products or simply to change sourcing patterns. Therefore, companies believe that the ITA would help them to be more competitive. However, the Jalisco state government is reportedly resisting the idea and is instead pushing for more local sourcing.

PROTECTION OF INTELLECTUAL PROPERTY RIGHTS (IPR)

Mexico has taken many steps to address IPR issues. It is a signatory to at least 15 international treaties dealing with IPR, and

has recently proposed amendments to strengthen enforcement of its own IPR laws. However, reports of software piracy in Mexico continue, even though the Mexican government has been stepping up enforcement efforts (see Chapter 3, Software Market). For complete information on protecting intellectual property in Mexico, please see the *Mexico Country Commercial Guide for FY 2002*. The report can be found at www.USATrade.gov.

EXPORTING AND PRICING YOUR PRODUCT

Products exported to Mexico should be imported by a registered Mexican importer (registered with the Ministry of Economy). If a registered Mexican importer is not used, the product will be subject to additional taxation.⁵ Import taxes (value-added taxes (VAT)) and import duties (if applicable) are assessed on the f.o.b. value of the product, plus any inland U.S. freight charges and any other costs listed separately on the invoice (for example, packing costs, insurance).

5. Additional taxes on products not imported by a registered Mexican importer: Products imported under an FTA that include the appropriate certificate of origin and labeling are subject to an additional 3 percent VAT tax. Products imported from non-FTA countries are subject to a 30 percent tax.

The following taxes and fees apply to products imported into Mexico:

1. VAT (known as IVA) - 15 percent to areas of Mexico outside the “border zone”.
2. VAT - 10 percent for products exported to the “border zone” (defined as 20 km from the U.S.- Mexican border).
3. Custom Processing Fee (known as DTA) - \$159.00 pesos (standard fee).
4. Disconsolidation fee - \$100 pesos (standard fee).
5. Other IVA charges for services such as inland Mexican freight, warehousing and custom brokerage fees also may apply.
6. Import Duty - if the product is not already duty-free under NAFTA or if the product does not meet the NAFTA rule of origin.

U.S. exporters need to take all these costs into consideration when pricing their product. The VAT (IVA) is typically recovered when the product is sold. However, U.S. companies need to consider whether they can competitively price their product against domestically produced goods not subject to these costs.

CHAPTER 2: TELECOMMUNICATIONS

REGULATORY ENVIRONMENT

Mexican Government Regulatory Bodies

The Secretariat of Communications and Transportation (SCT) is the Government of Mexico's (GOM) Ministry responsible for setting telecommunications policy. The SCT retains sole responsibility for issuing all concessions and permits for telecom services. Under the SCT is COFETEL (the Federal Telecommunications Commission), the body that regulates the telecommunications sector in Mexico. COFETEL regulates and monitors the dominant carrier Telmex for compliance with the terms of its concession or license, including network expansion, quality of service, and interconnection with other service providers. In conjunction with the National Standards Consultative Committee, the SCT also issues technical standards for telecommunications equipment.

The SCT has granted concessions for public telephone networks, wireless networks/services (including cellular, trunked radio, and paging services), and other communications networks available to the public. In addition to granting concessions, the SCT issues permits for Very Small Aperture Terminal (VSAT) and private network services. To obtain a concession or permit requires companies to file applications with the SCT and to comply with rules governing interconnection to the public switched telephone network.

Licenses and frequencies are awarded officially by the SCT (based on the

recommendations of COFETEL), while COFETEL oversees the market, regulating network access fees and establishing service standards. COFETEL's board consists of a president and three commissioners. Decisions are reached by a board majority.

U.S. Trade Representative Addresses Mexico's WTO Telecommunications Commitments

Since the late 1990's, Mexico has been consistently identified in the 1377 Report from the U.S. Trade Representative (USTR) to Congress as a country with insufficient competitive safeguards in its telecom market. As a result, in 1999 the USTR, with the support of U.S. industry, initiated a process to bring Mexico before the World Trade Organization (WTO) for failing to live up to its commitments to create a pro-competitive regulatory environment. During 1999 and 2000, several rounds of informal and formal consultations took place between the U.S. Government and the GOM regarding Mexican obligations as a party to the WTO General Agreement on Trade in Services (GATS) and the Reference Paper on Telecommunications under the Agreement on Basic Telecommunications Services.

In 2000, the USTR filed a WTO complaint against Mexico citing a number of issues:

1. Mexico's failure to regulate Telmex through the promulgation and enforcement of asymmetrical dominant carrier regulations;

2. The failure of Mexico's regulators to ensure the adoption of cost-based interconnection tariffs for domestic long distance calls;
3. The failure of Mexico's regulators to ensure the adoption of cost-based off-net tariffs for calls outside a new-entrant's network; and
4. Mexico's failure to promulgate rules allowing for cost-based interconnection at any technically feasible point on a network, including cross-border interconnection.

Soon after the initiation of the U.S. WTO complaint, COFETEL imposed new asymmetrical regulations on Telmex. Telmex appealed the restraints through a series of lawsuits that were largely successful because of the relatively weak legal position of the regulator. Despite continuing pressure by the U.S. to open its market to competition, Mexican trade and telecom officials claim that Mexico is complying with all of its WTO telecommunications obligations. Mexico did address several complaints raised by USTR, but not the issue of opening its international long-distance market.

In 2000, COFETEL and Mexico's national carriers agreed on an interconnection tariff for 2001 of approximately 1.25 cents per minute. In consultations with USTR, COFETEL stated this rate was based on costs, but included other elements such as "fair profit." Negotiations are still ongoing to set the 2002 rates.

Telmex developed a top-down formula for an off-net rate that was accepted by its industry competitors as part of a sweeping agreement signed in January 2001. The formula is not cost-based, and is dependent upon Telmex's lowest published price for large customers. COFETEL has been largely unsuccessful in ensuring that Telmex officially publishes its tariffs, skewing the off-net price model away from marginal cost.

International interconnection, or settlement rates, has been one of the most contentious issues. USTR points out that Mexico had undertaken to ensure cost-based interconnection at every technically feasible point on the network, including at the U.S.-Mexico border. USTR urged Mexico to change its telecom rules to allow for international simple resale (ISR) or some alternative that would allow the cost of international calls to be determined by market forces. The GOM has refused to amend the existing rules.

In January 2001, WorldCom (U.S.) and Telmex agreed on a settlement rate plan to reduce tariffs through 2004. After 2004, the agreement will allow for settlement rates to be negotiated by any legal carrier via market mechanisms. The terms of the agreement require that Mexico alter its telecommunications law to allow for these mechanisms to function after 2004. AT&T and other industry participants believe the agreement does not open Mexico's market quickly enough, and have filed briefs against the agreement which is currently before the FCC for approval. If the FCC does not endorse the plan, the parties must quickly resume negotiations to arrive at a new

settlement rate plan that will cover 2002 and beyond.

Early in 2002, Telmex and Worldcom concluded an agreement to reduce U.S.-Mexico settlement rates to an average of 9 U.S. cents. However, the announced reductions still result in rates that are not cost-oriented and are therefore still inconsistent with Mexico's WTO obligations. The proposed rates are still well above the cost of providing the wholesale interconnection service to U.S. carriers. Thus, these high wholesale rates will continue to translate into high retail rates that Mexican and U.S. consumers pay to stay in touch.

Because of the lack of progress on these issues, on February 13, 2002, the USTR announced that it would request a WTO dispute resolution panel in Geneva to rule on what the U.S. views as significant violations of Mexico's WTO commitments in the telecommunications sector (for text of the press release, please visit the USTR Web site: <http://www.ustr.gov/releases/2002/02/02-19.htm>).

USTR Robert B. Zoellick said the U.S. has requested the WTO dispute settlement panel because bilateral efforts to open Mexico's market to foreign competition have stalled. The USTR's statement of February 13 describes four (4) grounds on which Mexico's international telecom rules contravene Mexico's commitments under the General Agreement on Trade in Services (GATS). They were negotiated to complete work on international rules for telecom trade that remained unfinished when the Uruguay Round ended in 1994. These include Mexico's failure to:

- ensure that U.S. carriers can connect their calls to Mexico on reasonable rates, terms, and conditions;
- ensure that U.S. firms have reasonable and non-discriminatory access to and use of Mexico's telecom network;
- provide "national treatment" to U.S.-owned telecom "resellers"; and
- prevent Mexico's dominant carrier (Telmex) from engaging in anti-competitive practices.¹

Telecommunications Services Tax of 2002

On January 01, 2002, the Mexican Congress passed a tax reform package that imposes a 10 percent tax on telecommunications and related services. Passage of the legislation came amid widespread condemnation by telecoms executives, many of whom argue that the tax will impede investment, including participation in the Fox administration's E-Mexico universal connectivity plan. Local industry analysts anticipate the tax will squeeze telecom profits and prompt a slow down in telephone use.

The list of services subject to the tax includes:

1. The U.S. Department of Commerce welcomes additional comments from industry on foreign barriers to trade for consideration during the new WTO Round negotiations (scheduled to begin in June 2002). For more information, please contact Dan Edwards at tel.: (202) 482-4331 or submit comments by e-mail to Daniel_Edwards@ita.doc.gov.

- fixed and mobile wireless access services
- paging services
- restricted or paid television
- any other service that would be rendered as a final telecommunications service

Notably, the legislation exempts:

- rural basic telephony
- international long-distance
- public telephony
- pre-paid mobile cards of up to 200 Mexican Pesos (roughly USD \$20.00)
- co-location
- administration or domain services
- monthly Internet fees
- emergency services
- services between telecommunications companies, such as interconnection and provision of capacity

The government estimates that the new telecom tax will generate annual revenues of 8 billion Pesos (USD \$873 million) for the 2002 budget.

Telecommunications Reform in 2002?

Telecom reform was a cornerstone of President Vicente Fox's election campaign, in part because reform is key to attracting foreign investment to the sector. However, clashes between Mexican government bodies over how much autonomy to give COFETEL have stalled recent progress on regulatory reform. While COFETEL is fighting for the autonomy needed to constrain TELMEX, the SCT wants to keep at least some of the control it currently has over COFETEL. In addition, some of

President Fox's cabinet appointments have led several analysts to label him as neutral regarding competition issues in the sector. On November 22, 2001, the SCT named Mr. Jorge Arredondo Martinez as Chairman of COFETEL and during the week of January 21, 2002, the SCT named the three new COFETEL Commissioners to work under Chairman Arredondo Martinez. The three new commissioners are listed below and it is important to note that each has some tie to TELMEX:

- Abel Mauro Hibert Sanchez
Economic Commissioner
- Gerardo Soria Gutierrez
Legal Commissioner
- Jose Luis Munoz Balvanera
Technical Commissioner

Biographies of the four individuals who make up COFETEL's new leadership are located in the Appendices section of this report.

According to press reports, the SCT and COFETEL disagree mainly over the following issues:

- Currently, it is SCT's prerogative to name the president of COFETEL and three commissioners. COFETEL wants this prerogative to belong to the Mexican Congress.
- COFETEL wants to report to Congress, while the SCT wants the agency to report to the executive branch.

- The SCT wants COFETEL to publish its resolutions, including how each commissioner votes, and to keep an open registry of deals between different operators. COFETEL believes this much transparency would threaten its autonomy.

Many analysts believe that the Fox administration may eventually take steps to strengthen COFETEL, possibly by issuing a clear mandate for the agency and providing it with independence from the SCT and the legal authority to act. Mexico's Congress is presently in the early stages of discussing a draft telecom reform law that it hopes to pass in September 2002. COFETEL, the SCT, and the Mexican Congress are soliciting input from industry and academia on all aspects of reform, including transparency, universal service, and the future of Mexico's telecom regulatory structure. U.S. industry officials have repeatedly implored the Mexican government to enforce the laws in place before pushing ahead with further telecom reform. A lack of action by the Mexican government to address these issues would have detrimental effects on Mexico's telecom sector, including discouraging higher levels of foreign investment. In addition, Mexico's fledgling broadband service sector could be severely restricted if TELMEX is allowed to alter market dynamics without the threat of strong regulation to promote competition.

Some Mexican industry experts predict that broad congressional overhaul of the 1995 FTL is unlikely in 2002. At best, they foresee a few articles being reworked in the law. At worst, Congress might decide to

tackle the issue of local-loop unbundling which could stall reform altogether due to TELMEX's influence. Further, many observers expect that the next session of Congress (April-June 2002) will open with a legislative agenda that places energy and labor before telecom concerns. As such, most predict that real work on telecom reform will be delayed at least until the following congressional session (September-December 2002).

Some of TELMEX's rivals have reportedly reached individual agreements with TELMEX through bilateral negotiations. However, most still support efforts to improve the environment for competition through legislation.

Conclusion

Mexico's telecom sector is on the verge of rolling out broadband service in Mexico City and competition may soon emerge between satellite, cable, and telephone service providers mainly following the U.S. model. However, TELMEX's dominance and its propensity to act with impunity across the sector threatens competition in Mexico's emerging telecom industry, but this threat could be averted if Mexico acts to enforce pro-competitive regulations in the telecom marketplace.

FIXED-LINE MARKET

This section is divided into three parts, providing analysis of past, present, and future trends in Mexico's fixed-line communications market. First, we present a general overview of the Mexican fixed-line telephony marketplace, highlighting the comparative lag that has developed as a

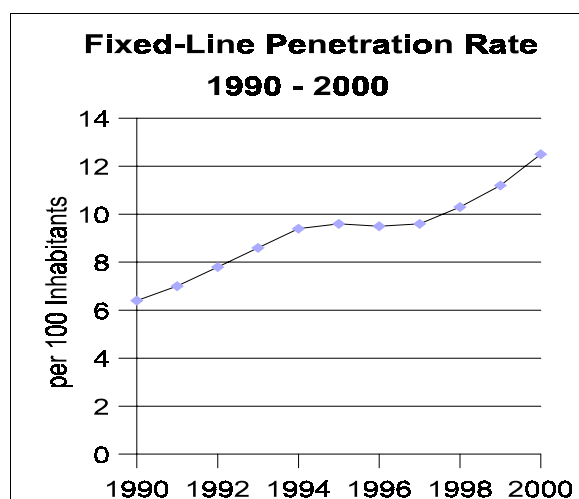


FIGURE 2-1. Source: COFETEL

result of the incumbent TELMEX's dominant position. Second, we provide an analysis of the local loop and long-distance services markets. And, third, we discuss the fast-growing data communications market.

Market Overview

Mexico's relatively low fixed-line teledensity and resultant pent-up demand, coupled with its population of approximately 100 million, represents a market with considerable growth potential (see FIGURE 2-1). Service providers and equipment vendors alike stand to benefit from the liberalization of the sector, which began in 1990. Despite the unquestioned dominance of TELMEX through year-end 2001, several companies are emerging to challenge the telecom giant's traditional stranglehold on local loop and long-distance services. While the long-term prognosis remains uncertain, signals indicate that there is not only room for competition, but also that such competition may benefit from legislative reform. A new Federal Telecommunications Law (FTL) may be

enacted in 2002 that would update the existing telecommunications bill of 1995. The new bill will aim to legally and financially empower the telecom regulator COFETEL by establishing autonomy from the SCT, which until now has driven COFETEL decisions and policies.

According to Pyramid Research, basic telephony and data communications services combined to generate roughly \$8.1 billion in revenues at year-end 2000. Local telephony was the largest segment of the market, accounting for 58 percent of revenues.² Many industry analysts predict that local telephony will continue to dominate the revenue stream in the fixed-line sector. This expectation is based upon two factors: 1) the heightened regulation of the dominant carrier TELMEX in recent years, first by the SCT and then by COFETEL since its inception in 1996, and 2) the long-distance market's accelerated maturation and relatively lower interconnection and settlement rates.

La Asociacion Mexicana de la Industria de Tecnologias de Informacion (AMITI) expects the new FTL to be enacted by Spring 2002 that would make COFETEL an independent agency from the SCT.³ This development would serve to bolster COFETEL's ability to address effectively the monopolistic behavior of TELMEX, driving down the price of long-distance rates further. Accordingly, new entrants to the

2. "Communications Markets in Mexico: Blurring barriers and escalating competition." July 2001. Pyramid Research, The Economist Intelligence Unit. Cambridge, MA, Pg. 47.

3. Interview with Mr. Luis Vera, Legal Advisor, AMITI, on September 28, 2001.

fixed communications marketplace are expected to invest most heavily in the local telephony sector, especially given certain TELMEX policies that increase the attractiveness of specific market niches, such as not investing in areas where demand for telephone lines is less than 2,000 subscribers.⁴

As transmission of data becomes increasingly crucial to the corporate sector, the segment with greatest room for growth in the next five years will likely be data communications. This should increase demand for bundled packages of services and spur investment in end-to-end technologies that enhance the competitiveness of new entrants' offerings. Additionally, demand for telecom equipment is sure to increase over the next five years, as both residential and corporate clients drive telecom operators to upgrade their networks to take advantage of higher-speed technologies that maximize the potential of the Internet.

Local Loop and Long-Distance Services

At just over 12 percent (see FIGURE 2-1), Mexico has one of the lowest fixed-line penetration rates in the Americas, compared with roughly 66 percent in the United States and 64 percent in Canada. Growth in this sector has been slow, despite declining local and long-distance rates (in real terms). With its population of close to 100 million and latent demand for telecommunications services fueled by the Internet's growth, Mexico has attracted an increasing number

of new entrants. At the same time, market entry attempts have been hampered by a mix of anti-competitive behavior by the incumbent provider TELMEX and the inability of the regulator COFETEL to ensure that measures to promote competition are enforced.

Given the impressive revenues generated by local telephony, most analysts expect fixed-line penetration to reach 18-19 percent by year-end 2005.⁵ Service providers are likely to utilize fixed wireless technologies as a quick and cost-effective means to build out their networks and meet pent-up consumer demand. To date, competition in local services has been less intense than in long distance, with TELMEX retaining a virtual monopoly in local telephony. However, long-distance competitors Alestra and Avantel have made recent inroads into the local-loop and, as a result of well-crafted marketing strategies, like bundled service offerings, the landscape for local telephony is gradually becoming more competitive.

Local Loop Services

As already mentioned, Mexico's main-line penetration rate remains relatively low, at slightly more than 12 percent at year-end 2000. This situation has been the result of Mexico's history of limited competition in local telephony. TELMEX's existing network is vast, but it is mostly copper wire and will face competition from wireless local loop (WLL) technology and rival telcos that are in the process of deploying fiber optic cable. This development should

4. Interview with Mr. Moises Polishuk of Asesoría en Sistemas, Seguridad y Teleproceso (ASISTE) on September 28, 2001.

5. *Mexico Report*, World Markets On-Line Service (<http://www.worldmarketsonline.com>). 2001 World Markets Research Centre. London, England.

drive the price of enhanced technology down for end users, since TELMEX will likely respond by expanding its network through deployment of the same technologies.

To sway local customers away from TELMEX, new entrants will have to invest heavily in network build-out and begin marketing end-to-end as well as value-added services (VAS). This deployment must be well-planned and aggressive, as delays in service or reliability might drive many end-users over to the mobile services market. Favorable policy decisions by regulatory authorities on local-loop unbundling and telephone number portability would make the switching of telecom service providers more feasible for corporate clients and attract foreign investment to the industry. Such telecom reforms were among the campaign promises of President Vicente Fox, but many industry observers argue that the Mexican Congress is at least a year away from agreement on them. There is much at stake. Pyramid Research estimates that during the coming years, local service revenues will continue to increase, from \$5.2 billion in 2001 to \$8.2 billion in 2005 (see FIGURE 2-2).⁶

The new entrants into Mexico's local services market are: Avantel, Alestra, AXTEL, MAXCOM, MCM Telecom, MetroRED, and MetroNet. Along with the incumbent TELMEX, Avantel and Alestra are multiservice operators (MSOs); AXTEL and MAXCOM are competitive local

exchange carriers (CLECs); and the remaining three competitors are competitive access providers (CAPs). To date, TELMEX maintains the most extensive copper network, offers the most comprehensive array of services, and supports the largest client base in Mexico.

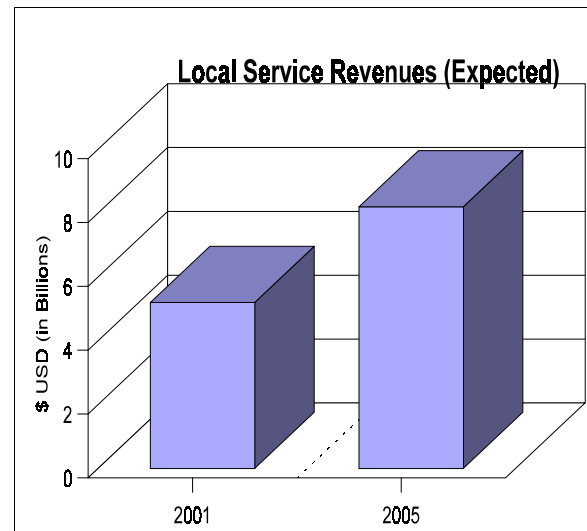


FIGURE 2-2. Source: Pyramid Research

Additionally, TELMEX possesses more than 68,000 kilometers of fiber optic cable and enjoys a wireless local loop (WLL) license. TELMEX is the uncontested leader in the local services space, with roughly 97 percent of main lines as of year-end 2000.⁷

TELMEX is expected to retain its dominance in the local services arena during the coming years, using its substantial revenues to further digitalize its network and expand offerings to match those of its competitors. Its comparative advantages in name recognition, established networks of business relationships, nationwide coverage, and ability to offer corporate discounts

6. "Communications Markets in Mexico: Blurring Barriers and Escalating Competition." July 2001. Pyramid Research, The Economist Intelligence Unit. Cambridge, MA.

7. Ibid.

create a “David vs. Goliath” battle for the CLECs, CAPs, and MSOs. At the same time, the latter offer an alternative to TELMEX, one especially welcomed by those operators who must lease lines to complete their networks and, as competitors, may not enjoy the same level of service as the incumbent’s own end-users. More importantly, TELMEX’s weak link may be its own well-documented unhappy customers. Avantel and Alestra have unveiled marketing strategies that concentrate on Mexico’s three largest urban areas: Mexico City, Guadalajara, and Monterrey. The new entrants are targeting TELMEX’s existing corporate clients first, then they hope to take a piece of the small business market and, finally, they plan to offer residential service. Avantel executives expect to begin that final stage in early 2002.⁸

Despite TELMEX’s overwhelming market dominance, it faces growing competition in the provision of local telephony services. Indeed, by year-end 2000, ten new concessions had been granted to provide local telephony with fixed technology and seven new concessions had been issued to provide the service with wireless technology. In total, 19 concessions have been issued for local telephony, including TELMEX and its subsidiary.⁹

To compete effectively in the local loop, new entrants should target a specific market, choose and deploy an access technology

suitable to that market, engage in strategic alliances to provide a wider array of services, and push for an expeditious resolution to the regulatory issues discussed in this report.¹⁰

Long-Distance Services

Within fixed-line services, the long-distance market has attracted the greatest initial competition since January 1, 1997, when Mexico liberalized its long-distance services sector to encourage competition. While new entrants have realized more success in the long-distance services sector than in the local loop, TELMEX has managed to maintain its dominant position vis-a-vis the eight emergent long-distance competitors (Avantel, Alestra, Bestel, IUSACELL, Marcatel, Miditel, Protel, and Unefon-RSL). Pyramid Research predicts that the first two operators that received long-distance concessions (U.S. companies Avantel and Alestra) are the only telcos that pose a serious threat to TELMEX. To date, TELMEX continues to enjoy 70 percent of domestic long-distance (DLD) traffic and 78 percent of international long-distance (ILD) traffic, while Avantel and Alestra’s combined revenues represent less than one tenth of TELMEX’s revenues.¹¹

Competition in this sector is now a reality in all of the main cities in Mexico. By year-end 2000, 17 new licenses had been issued to provide long-distance service and tariffs continue to fall with increased

8. “Cease Fire.” *Latin Trade*, September 2001, pp. 57-58.

9. 2001 World Markets Research Centre. London, England.

10. “Communications Markets in Mexico: Blurring barriers and escalating competition.” July 2001. Pyramid Research, The Economist Intelligence Unit. Cambridge, MA.

11. Ibid.

competition.¹² Additionally, Mexico's geographic proximity to the United States and Canada, coupled with the implementation of the North American Free Trade Agreement (NAFTA) in 1994, has increased demand in Mexico for ILD services from both the corporate and residential sectors (measured by minutes of use). On the other hand, the outlook for long-distance revenues in the fixed-line market is lukewarm. While ILD usage will increase in the coming years, the monthly average revenue per line (ARPL) for ILD will continue to decrease due to the falling rates that competition has achieved. The landscape for DLD is similar, where the increase in usage will not offset the drop in tariffs. The most drastic decrease in ARPL will be in the average DLD revenue per business line, which Pyramid Research expects to fall from \$40 in 2001 to \$33 in 2005.¹³

Long-distance competitors in the fixed-line market are beginning to realize the benefits of diversifying their service offerings, given TELMEX's dominance in the arena and the advent of Voice over Internet Protocol (VoIP) technologies that may siphon off a percentage of clients. Indeed, revenues generated from data communications and Internet services may surpass those of long-distance services in the coming years.

Data Communications Sector

Between 1996 and 2000, revenues generated from data communications services nearly tripled, from \$285 million to \$820 million.

12. Ibid.

13. Ibid.

Increased demand for data transfer capabilities and Internet services, fueled by corporations that are beginning to take advantage of e-commerce solutions (B2B and B2C), has spurred remarkable growth in the packet-switched services market. Frame relay technology became available in Mexico in 1994 and has gained a significant foothold in the marketplace. This development has coincided with declining corporate concern about the security of electronic transmission of sensitive data and has prompted operators to migrate from X.25 technology to higher bandwidth frame relay switching.

The incumbent TELMEX maintains a dominant position in the data communications segment, enjoying the benefits of its extensive and mostly digitalized network, satellite connectivity, and the ability to integrate voice, data, and Internet services. At the same time, new entrants Avantel and Alestra are making inroads by expanding their portfolio offerings, creating strategic partnerships with other carriers and VAS providers, and emphasizing quality of service to provide

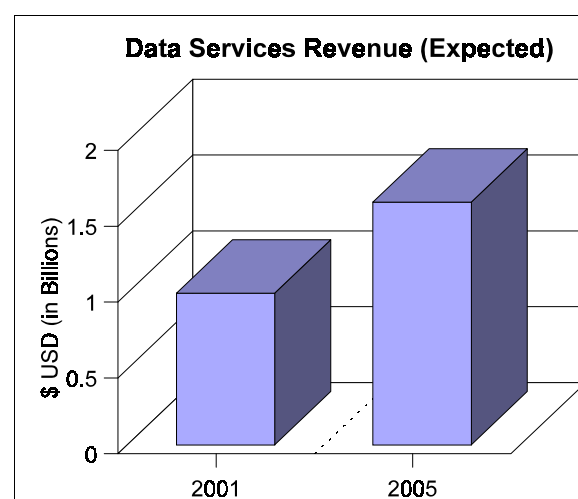


FIGURE 2-3. Source: Pyramid Research

end-to-end solutions. Increasing competition will lead to a decline in tariffs. Pyramid Research predicts that data communications revenues will increase from \$1.0 billion in 2001 to \$1.6 billion in 2005 (see FIGURE 2-3), with the fastest growing segment being IP-based services, expected to reach \$430 million in revenues by year-end 2005.¹⁴

WIRELESS MARKET

Market Overview

The recent proliferation of wireless communications in Mexico has been so extraordinary that the country is now considered one of the region's most promising markets for wireless equipment and services. According to COFETEL, mobile subscribership in Mexico grew from 1 million in 1996 to more than 14 million in 2000, a combined annual growth rate (CAGR) of close to 90 percent (see FIGURE 2-4). Over the past two years, the use of wireless in Mexico has truly exploded, with more than 6 million new subscribers added to the rolls in 2000. In the last five weeks of 2000 alone, nearly a million Mexicans contracted for mobile services, and by the end of the year, mobile penetration stood at more than 14 percent. The year 2000 also saw wireless penetration surpass fixed line penetration in the country for the first time-- 14.1 million wireless subscribers at the end of the year, versus 12.3 million wired lines. Wireless is expected to continue to draw significant amounts of voice traffic away from wireline networks over the coming years.

14. Ibid.

In 2001, a little more than a decade after its introduction, Mexico's wireless communications sector continued to grow at an astounding pace. As of June 2001, there were over 18 million wireless subscribers in Mexico. Telcel, Mexico's largest wireless operator, nearly doubled its subscribers over a one year period (June 2000 - June 2001). Total subscribers were expected to reach about 20 million at year-end, with penetration approaching 22 percent. New market entrants continued to grow their networks and expand their coverage over the year, aided in some cases by foreign investment. The major wireless operators made huge investments in their networks,

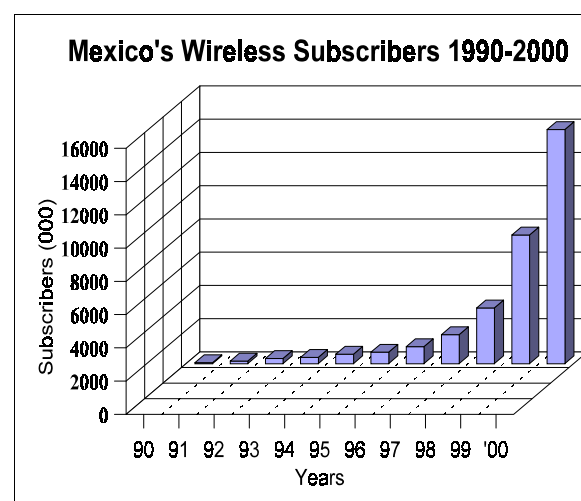


FIGURE 2-4. Source: COFETEL

with capital expenditures estimated at more than \$600 million.

Significant changes are expected to accompany rapid growth in the wireless market over the next few years as competition heats up and operators consolidate their holdings in the market. In addition to shifting their focus to

lower-income segments of the population, wireless operators are expected to target corporate segments with high-end, high-tech applications as the further introduction of advanced technologies gradually permits new mobile services.

Despite its impressive track record, Mexico's wireless sector still has a number of problems to sort out. Unpredictable service, high rates of dropped calls, and the entry of new participants have kept the churn rate high (an estimated 30 percent of subscribers defected to other operators in 2001). Churn is expected to increase in 2002 as the rate of subscriber growth slows somewhat and competition becomes increasingly fierce. In addition, average revenue per subscriber has been declining since 1999, taxing the profitability of all participants.

Nonetheless, most participants in Mexico's wireless sector are bullish about prospects for the sector's future growth. The wireless market has more than quadrupled over the last three years and, while the pace may slow somewhat, growth is expected to remain robust. Ericsson, one of Mexico's main equipment suppliers, predicts that penetration will rise to 40 percent by the end of 2005. This prediction is considered credible, as equivalent rates of growth have been achieved by other countries with similar levels of per capita incomes. Pyramid Research estimates that the combined annual growth rate (CAGR) for 2001-2005 will approach 20 percent (the Appendices section of this report contains more detail on the development of Mexico's wireless sector).

Current Wireless Networks and Major Participants

By the beginning of 1999, Mexico's wireless sector had consolidated from 10 participants to four: Telcel, IUSACELL (which consisted of four consolidated central region operators), a collection of northern operators led by Motorola, and Portatel del Sureste. In February 1999, a license was awarded to a fifth operator, Pegaso PCS, and in early 2000, Unefon became Mexico's sixth operator. In 2001, Telefonica (Spain) purchased all of Motorola's shares in different wireless operators in northern Mexico and issued a letter of intent to purchase Portatel del Sureste.

Major Wireless Service Providers

The following major networks currently provide wireless services to Mexico's nine service regions (see the Appendixes section of this report for details on the wireless networks that existed in Mexico as of 2001):

Telcel (aka: América Móvil and Radiomovil Dipsa, www.TELMEX.com, www.americamovil.com)

Telcel is the largest wireless operator in Mexico and, with the combined assets of its holding company America Movil, ranks as the largest operator in all of Latin America. From its inception, Telcel benefitted from the relative lack of competition, early exclusive nationwide coverage, the relatively rapid digitalization of its network, and the power of its parentage--TELMEX. Telcel had the majority of Mexico's subscribers during most of the 1990s, ranging from 55-65 percent of the national

market, according to Pyramid Research. Despite the effects of competition in recent years, in the third quarter of 2001, Telcel controlled about three quarters of the Mexican market with more than 14 million subscribers.

Telcel was spun off from the wireless business of TELMEX (known as Radiomóvil DIPSA), and eventually became a joint venture between TELMEX, Bell Canada International Inc. (BCI, Montreal) and SBC Communications Inc. In 2001, TELMEX sold controlling interest in Telcel to the international holding company America Movil. America Movil still operates under the trademark Telcel. America Movil/Telcel has subsidiaries and joint ventures in the telecommunications sector in many other countries in the hemisphere including Guatemala, Ecuador, Argentina, Brazil, Colombia, Venezuela, the United States, Puerto Rico and Spain. For expansion in Latin America, América Móvil formed a joint venture company with Bell Canada and SBC. Among their U.S. holdings are CompUSA, Inc. (49 percent) and TracFone Wireless, Inc (97 percent). The company had estimated sales totaling \$2.75 billion in 2000.

Today Telcel's network covers about 18 percent of the geographical area of Mexico, representing approximately 85 percent of the population, and provides service to over 100,000 cities and towns throughout the country. The company holds licenses to operate in all nine of Mexico's telecommunications regions (see FIGURE 2-5 for a diagram of the wireless regions), thus making it the only wireless operator with nationwide coverage in cellular and PCS. In some regions, Telcel's market

share is even higher than its national market share. For example, Telcel has an 85 percent share of the Nuevo Leon market.

Despite an economic slowdown in Mexico, Telcel was one of the country's premier performers in 2001. A reasonably strong fourth quarter was also predicted, and Telcel ultimately met projections for the company to end the year with more than 16 million subscribers. Toward the end of 2001, America Movil announced it would invest an additional \$1.1 billion in Telcel in 2002. Telcel was the first operator to launch National Automatic Roaming, and now offers prepaid digital services (Sistema Amigo) as well as Caller ID and Short Message Service (SMS). Telcel launched WAP services in 2000, in collaboration with Ericsson. Subscribers are required to pay a monthly fee that allows them unlimited access to specific information channels. In 2000, Telcel also reached an agreement with Ericsson for the deployment of a nationwide General Packet Radio Service (GPRS)/Global System for Mobile (GSM) technology network. The first phase of the network was launched in 2001. Telcel thus became the first operator to deploy GPRS/GSM in the country. The network is expected to be the largest of its kind in the Latin American region and will reportedly serve as a platform from which to launch third generation (3G) services. Also in late 2000, América Móvil contracted with the U.S. company Phone.com for commercial wireless Internet service using the Phone.com™ Wireless Application Protocol (WAP)-based platform.

IUSACELL

IUSACELL is the second largest wireless operator in Mexico and Telcel's main competitor in cellular mobile services. IUSACELL operates primarily in the south of Mexico. It is licensed to operate in four of Mexico's nine regions, including Mexico City, Central, Western and Southern Gulf. IUSACELL's subscriber growth for 2000 was estimated at about 27 percent. The company's subscriber base totaled 1.64 million at the end of the second quarter of 2001, a 6 percent increase compared with the same quarter of the previous year.

Carlos Peralta, a Mexican industrialist, founded IUSACELL in the early 1990s. The company expanded rapidly in the early 1990s by purchasing concessions in telecommunications Regions 5, 6, and 7. IUSACELL is presently 37 percent-owned by Verizon and 34.5 percent-owned by Vodafone (UK). Vodafone reportedly paid the Peralta family \$973 million for its share. At the time of market entry, Bell Atlantic viewed Mexico and IUSACELL as its platform for expansion in Latin America. To date, most of the equipment for IUSACELL's networks has been supplied by Northern Telecom and Motorola.

In July 2001, IUSACELL announced plans to launch an international roaming test in Asia in cooperation with China's Horizon Mobile Communications. Success will allow the operators--both of which use Code Division Multiple Access (CDMA) technology--to expand their service offerings, extend coverage and add value to their operations. Also in 2001, IUSACELL acquired a 90 percent stake in a smaller operator in Mexico, Grupo Portatel for an

estimated \$72 million. The acquisition gave IUSACELL an addition to its customer base of about 100,000 subscribers and a national presence for the first time.

Telefonica Moviles Mexico ***(www.telefonica.com.mx)***

As noted above, in 2001 Telefonica (Spain) purchased all the shares held by Motorola in different wireless operators in northern Mexico for an estimated \$1.79 billion. Telefonica's objective was to compete with the other key players in the pan-American wireless market such as BellSouth Corp. and America Movil. The mobile arm of Telefonica, Telefonica Moviles Mexico, took over management control of Cedetel, Bajacel, Norcel, and Movitel in 2001. In the process, Telefonica gained a combined client base of more than one million subscribers, and a presence in four out of nine operating regions. In October 2001 Telefonica announced plans to combine its operations in Mexico in a new subsidiary, Telefonica Moviles Mexico.

Telefonica had previously signed a \$41 million expansion contract with Motorola for CDMA equipment to upgrade the networks. The agreement will provide a platform from which the company can eventually migrate to 2.5 generation (2.5G) services and 3G services, providing increased voice capacity and data rates. In June 2001, Telefonica signed a letter of intent to acquire Pegaso PCS. The deal would add Pegaso's 1.6 million subscribers to Telefonica Moviles' existing client base, realizing Telefonica's goal of replacing IUSACELL as Mexico's second largest mobile operator.

Pegaso PCS

In February 1999, Pegaso PCS, a new and aggressive operator, entered the Mexican market. Widely touting the “superior quality of its all digital network”, it began providing service in Tijuana and eventually expanded to 11 other major metropolitan areas. By the end of 1999, after selling 50,000 phones during the first three weeks of operation in Mexico City, Pegaso had gained 110,000 subscribers.

Pegaso began as a joint venture between QUALCOMM and Mexican investors, with QUALCOMM eventually transferring its shares to its spin-off, Leap Wireless. In December 1999, Sprint PCS brought additional management expertise when it took over a 30.5 percent share. (Both Sprint PCS and Pegaso were operating 1.9 GHz CDMA networks on either side of the border at that time, so it was a logical match). Recently, Sprint decreased its holdings in Leap, as did the other financial partners, Citicorp, LAIF and Nisho Iwai.

In 2000, Pegaso launched WAP services to attract high-end users and plans to pursue the strategy of offering mobile Internet and data services. In 2001, Pegaso launched fixed wireless services in all of the locations where it operated mobile services, including the Mexico City metropolitan area, Monterrey, Guadalajara, Tijuana, Chapala, Ensenada, Reynosa, Nuevo Laredo and Toluca.

Unefon (www.unefon.com.mx)

While Unefon is one of the country's smaller operators in terms of subscriber numbers, it is one of the largest holders of radio

spectrum, with nationwide licences at the 1.9 GHz PCS band as well as licences at the 3.4 GHz WLL and 7 GHz bands. Unefon, which originally stated that it would focus on the fixed wireless market, changed its strategy in mid-2001 and began focusing on the mobile market. Unefon is owned by a group that also owns TV Azteca (Mexico's second largest TV network) and Electra (a chain of electronics stores).

Unefon's growth rate has been remarkable. The operator, which launched services in June of 2000, had service in 13 cities within 18 months. According to company figures, the operator has averaged 13,000 new subscribers per week since the start of 2001. Unefon's subscriber base grew by 34.5 percent during the third quarter 2001, and at the end of September the company claimed a total of about 625,000 subscribers. The operator's stated goal is to sign up 1.5 million subscribers nationwide by 2004.

In December 2000, Unefon announced an initial public offering (IPO) for a 7 percent stake in the company. The company's reported weaknesses are a chronic lack of resources and the lack of an international partner. Unefon posted net losses of \$49 million in the third quarter of 2001. However, revenues have since risen 48 percent to \$49.4 million and the company reportedly broke even in the last quarter of 2001.

Unefon's marketing technique has been to woo disenchanted Telcel users. The first to employ a prepay-only strategy, it caters to middle and low-income customers. It markets services through Electra stores

where subscribers can purchase a fixed-wireless phone on credit with up front costs of less than \$10.

Nextel

Nextel International is also competing with these players. It has teamed with Motorola to establish a digital trunked radio network based on Motorola's integrated Digital Enhanced Network (iDEN) technology, which uses packet-based transmission methods. Nextel International is the largest Specialized Mobile Radio (SMR) service provider in Mexico. Nextel Mexico, headquartered in Mexico City, started operating in the country in August 1998. The cities of operation include Mexico City and Monterrey, among others. Nextel reported more than 270,000 subscribers as of March 2001.

Market Drivers and Dynamics

Explaining fully the reasons for the widespread acceptance and rapid growth of wireless in Mexico is somewhat complex. Analysts cite a myriad of factors for subscriber gains over the past decade. Reasons offered by Mexican consumers have ranged from the convenience and attractiveness of wireless services--an affordable, untethered alternative form of communication--to the status associated with owning a wireless phone. While some analysts cite the "cachet" attached to cellular usage as one reason for the early growth of wireless in Mexico, most agree that prestige alone was not sufficient to sustain growth. Other, more pragmatic factors ultimately led to the long-term success of wireless: increased competition from new market entrants; the introduction of digital

technology; wider area coverage; slowly declining service costs; the increasing availability of advanced services; and modest reductions in handset prices.

The main reason, however, for the burgeoning growth of wireless has been--and remains--Mexico's underdeveloped and inefficient wireline network which created years of pent-up demand for communications. In addition to status and business customers, Mexico's wireless sector tapped into a sizable pool of other



FIGURE 2-5. Source: COFETEL and Pyramid Research

potential customers--those either too poor or "geographically inconvenient" to justify a wire-based infrastructure. Wireless became the available, affordable means of communications for this demographic segment. As an example, on the Baja peninsula in Cellular Region 1 (see FIGURE 2-5), where large portions of the population were too poor to afford basic telephone service, there was little incentive for

TELMEX to extend its network into isolated, poorer neighborhoods. Wireless stepped in to fill the void, and has since made significant inroads in Baja. One consequence of this dynamic is that the market for wireless services has often been inversely related to the general economic well-being of a given community. The poorer the population, the more likely there will be niches for cellular to exploit simply for the purpose of providing telecom access, and a considerable portion of Mexico's population lives at or below the poverty line.

Prepaid Plans

To entice customers in lower economic strata, service providers have been mass-marketing prepaid plans in Mexico with spectacular success. Prepaid wireless services are purchased in advance of their use and do not require a service contract with a wireless provider. Prepaid appeals to segments of the market that will not otherwise be eligible for, or do not want, an open-ended or monthly contract. In Mexico, prepaid appeals to the millions of households in Mexico that can afford a phone, but do not have access to a fixed line.

Nearly 90 percent of Mexico's subscribers currently use prepaid plans, and more than 95 percent of new subscribers are selecting the prepaid approach. The number of prepaid subscribers is projected to be about 40.3 million out of 42.5 million wireless subscribers in 2005. Prepaid service offerings also benefit operators by cutting down on fraud and bad debt and relieving operators of expensive credit checks. Mexico's wireless network operators have found that not only were acquisition and operational costs lower with prepaid, but

there were also no billing or debt collection costs to worry about. Finally, prepaid also opened up entirely new market segments and lines of distribution.

To cite an example, following initial successes in market share penetration which at one point approached 25 percent, IUSACELL experienced a marked decline in market share in 2001 with the entry into the market of two new competitors, Unefon and Pegaso (see FIGURE 2-6 for a comparison of prepaid tariff rates). To counter this trend, IUSACELL announced that it would shift its strategy to include a

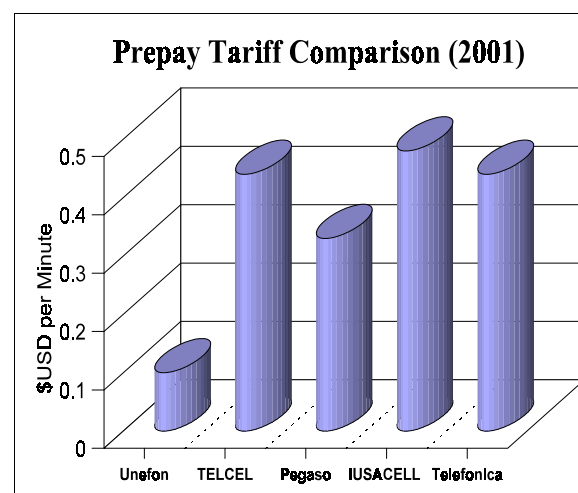


FIGURE 2-6. Source: COFETEL

broader segment of the market, for example, the lower socio-economic strata.

IUSACELL's stated goal is to shift its mix of subscribers from 70 percent prepaid and 30 percent contract, to 90 percent prepaid and 10 percent contract. Pre-paid subscribers reportedly now make up about three quarters of the operator's client base.

Calling Party Pays

In the United States, calls made to wireless phones are billed to the recipient of a call. In other parts of the world, however, the reverse is often the case. It is the calling party (wireline or wireless) that pays for calls to mobile phones. Many countries that use calling party pays (CPP) believe the system helps to grow the market, and Mexico may well be a case in point. In May 1999, a system of charging the caller for calls to cellular telephones was introduced in Mexico. Some analysts credited this action with a significant jump in subscribership--the 120 percent annual growth in wireless subscribers achieved during 1999. By June 2000, there were 10.8 million wireless subscribers, nearly doubling over the course of a twelve-month period.

Not everyone, however, agrees that the introduction of CPP in Mexico was a positive development. Mexican wireless carriers were not pleased when they discovered that the initiation of CPP appeared to cause a significant decline in wireline to wireless calls. The main problem, according to operators, is the high interconnection fees imposed by TELMEX for connecting a fixed phone to a cellular phone. The wireless operators have complained bitterly and publicly, and called for a revision of TELMEX's rates, invoicing, and collection for this service. In addition, with CPP, prepaid phones could be used even when cards are depleted, giving some low income users free phone service and reducing average revenue per unit (ARPU). Finally, the rapid growth credited to CPP also put a significant strain on many wireless networks, adding to consumer

dissatisfaction and prompting COFETEL to require concessionaires to upgrade the capacity of their networks. Despite these problems, however, it appears that CPP has more supporters than detractors, and CPP is likely to stay.

Quality of Service

As the competitive situation moves toward a new equilibrium, the battle will focus on new applications and the quality of service. In April 2001, COFETEL began examining mobile service quality on a city-by-city basis in 19 cities throughout Mexico. Call assessments included analysis of voice quality, handoff failures, dropped call rates, call connectivity, and blocked service. Operators were warned that they might be required to compensate subscribers with free airtime or face fines if quality of service was deemed poor.

Unefon, which has a reasonably good reputation for service quality and reportedly fared better in COFETEL's survey, attributes its rapid subscriber growth rate in part to the high quality of its service. The company's non-completion rate was about 2 percent and its dropped call rate was only about 0.3 percent, well below the maximum levels stipulated by COFETEL. Unefon's results in the survey were better than those of competitors IUSACELL, Telcel, and Pegaso.

Declining Prices

According to numerous studies, most consumers choose their wireless service based largely on price. The decline in the cost of wireless services has been a principle factor driving market growth in Mexico.

New entrants--notably Pegaso PCS and Unefon--have used price competitiveness effectively to compete with Telcel and each other.

While average PCS and cellular airtime prices in Mexico have declined over the past few years, the rate of decline has slowed somewhat. This trend presents operators with a dilemma, as further price reductions may be required to sustain the surge in usage seen to date and to penetrate the next socio-economic layer of customers. One of the main areas that affects cost is interconnection fees, since wireless operators are charged a fee to access the wired network. These fees--particularly those charged for access to the local loop - are considered relatively high in Mexico. Some wireless operators have cautioned that the recent rapid growth in the wireless services market might lead to overly complex pricing schemes that could confuse customers and hurt the industry. Also of concern, according to some officials, are potentially over-inflated promises about users' ability to access the Internet through new mobile phones.

Even though mobile data is still in its infancy in Mexico, the growth of intelligent networks is already forcing some service providers to reconsider their pricing structures. If mobile users are to remain connected to the Internet for extended periods of time, price structures must be modified so as to not discourage them from using wireless networks to go online. As prices decline throughout the industry, service providers will have to differentiate themselves by a variety of other methods including voice quality, customer service, and features like caller ID and

voice-activated dialing.

In November 2001, TELMEX announced plans to freeze its service rates starting in 2002 for local, long-distance and Internet services, reportedly to help subscribers through an anticipated period of poor economic performance.

Pegaso's marketing technique is unique in that the company applies a per second pricing policy. Its network is totally digital. It was the first to offer the ready-to-use "phone-in-a-box" marketing concept. Pegaso offers mobile Internet access to subscribers free of access and air time charges. Finally, Pegaso has offered discounts of up to 40 percent for high-use prepaid customers.

Competition

Fundamentally, the battle for market share in Mexico's wireless sector is now being waged by Verizon/Vodafone, Telefonica and America Movil. As noted, Nextel International is also competing with these players.

While competition has definitely been driving Mexico's wireless market, the efforts of Band A operators to compete with Telcel were mixed throughout the 1990s. At one point, these operators drew close to half of the country's market, only to see these gains diminish toward the end of the decade. Ironically, Telcel's gains took place in the years after the introduction of two new competitors, Pegaso and Unefon. While the wireless market as a whole and operators collectively grew rapidly in Mexico, Telcel reaffirmed its dominance by regaining 10 percent of the market share over an 18

month period, and it is expected to retain its dominant position for the next 3-5 years. IUSACELL has been struggling to retain subscribers while growing its customer base, and Telefonica is hobbled by the lack of a presence in Mexico City as well as a nationwide footprint.

Telcel's major assets in the battle for market share have been its nationwide coverage, its aggressive network build out, and its affiliation with America Movil. While new market entrants initially took customers away from Telcel, a significant number returned when they discovered the limits of the competitor's coverage area and, in some cases, service quality. Telcel attracted business customers back to the fold by announcing plans to move to next generation (2.5G) services. Telcel plans to retain subscribers by periodically introducing new services or applications as they become available.

Finally, a number of analytical groups have noted that when Telcel all but separated from TELMEX, it strengthened Telcel's position and gave the operator added flexibility. The split removed limits imposed by TELMEX (e.g. TELMEX's opposition to CPP), allowing Telcel to pursue strategies for its own best interests.

Many of the subscribers who returned to Telcel defected from IUSACELL and some of the operators in the Northern regions. According to Pyramid Research, IUSACELL had a 51.3 percent churn rate versus a 33.1 percent churn rate for Telcel. While both IUSACELL and the Northern operators are adjusting to their new partnerships with large multinationals, these partnerships are expected to improve the

position of these operators over time. Telefonica is reportedly taking steps to bolster and refocus its operators. Verizon and Vodafone will bring the expertise necessary for IUSACELL to transition to next generation services.

Industry Acquisition and Consolidation

Mexico's wireless sector appears very different today than it did three years ago thanks in part to consolidation within the industry. As noted, five operators came under the control of Telefonica in 2001. As is the case in the wireline industry, consolidation is expected to remain a factor as major players ally. Market share growth and the need to streamline to afford the tremendous capital costs required for further network development are two principle reasons. Mergers and joint ventures are often the fastest way to expand into new markets and cut costs by eliminating overlapping operations.

While it is true that the number of players increased from three to five over the past two years with the addition of Pegaso and Unefon, both of these operators are considered prime candidates for acquisition. In fact, Telefonica announced in March 2002 its agreement to buy out 65 percent of Pegaso from Sprint, Leap Wireless, and financial investors. Combined with the smaller cell phone operators it acquired in 2000, Telefonica promises to become Mexico's second largest wireless company. At the same time, Unefon has been talking to prospective international investors. Vodafone, Endesa, BellSouth, and AT&T Wireless have all expressed an interest in IUSACELL, and at one point, Telefonica signed a letter of intent with IUSACELL.

Finally, when TELMEX spun off Telcel to America Movil, it forced America Movil to merge with other operators to compete with the growing influence of international telecom companies such as Vodafone and Telefonica, which are following the trend of consolidation within the regional telecom industry.

Churn

Increased competition in Mexico's wireless sector has prompted many consumers to comparison shop and switch carriers more frequently, creating what the industry terms as churn. In addition, as wireless carriers continue to expand their networks, it is inevitable that some customers will grow disenchanted with spotty coverage or surprisingly high phone bills, and will either discontinue use or look to change operators. Price was reportedly the primary reason customers switched service providers. Total annual churn in Mexico's wireless market reportedly reached nearly 30 percent in 2000. Analysts generally agree that the future success of many carriers could hinge on their level of churn.

Challengers to incumbent cellular operator

Telcel are expected to eventually benefit from high churn rates. Aware of this fact, Telcel has begun to take steps to combat churn by applying longer-term, more customer-focused strategies. All operators are using network information and relating it back to the services they deliver to subscribers, even compensating customers for dropped calls in some cases.

Standards

Digital systems were initiated in 1996 when Telcel began to develop its Ericsson TDMA platform. Digital handsets did not become widely available for prepaid subscribers until 1999, keeping analog alive and well. Further conversion to digital technologies holds the promise of greater spectral efficiencies, a range of new applications, and more revenue for carriers. Pyramid Research predicts that the use of analog handsets will decline rapidly over the next few years to about only 5 percent of the subscriber base by 2005, as digital handsets are made available in prepaid packages.

Due to Telcel's dominance in the market, TDMA is the most widely used digital standard in Mexico. Telcel's subscribers are approximately 50 percent digital and 50

TABLE 2-1.

Number of Subscribers by Standard					
	1998	1999	2000	2001E	2002E
<i>AMPS</i>	2,975,867	5,432,521	4,687,122	3,596,379	2,244,943
<i>IS 136 TDMA</i>	275,570	1,636,329	4,884,959	7,263,044	9,213,500
<i>CDMA One</i>	50,600	663,150	3,515,711	7,274,399	11,011,485
Total Subscribers	3,302,037	7,732,000	13,087,792	18,133,822	22,469,928
Total Penetration	3.3 percent	7.7 percent	12.9 percent	17.6 percent	21.4 percent

Source: Mobile Communications International

percent analog. However, its traffic is 70 percent digital because the operator's heavy users are digital customers.

To compete with Telcel and create the potential for nationwide roaming, all other operators formed an alliance and selected CDMA for future use. By the end of 2000, however, only about 12 percent of subscribers used CDMA handsets. As more advanced services expand, TDMA will be pitted against CDMA.

While a license for a PCS network using GSM technology was issued, it was subsequently revoked. Telcel has since announced plans to migrate its existing AMPS/TDMA network to a GSM-based network in 2002, claiming that TDMA is more difficult to adapt to third generation technologies. Pyramid Research predicts that by 2005 about 14 percent of subscribers will be using GSM handsets (see TABLE 2-1 for a comparison of wireless standards in Mexico).

Alternative Distribution Channels

In the past, wireless services were almost exclusively marketed directly by service providers. Today, wireless services are distributed through a number of different marketing channels. Carriers in Mexico are currently distributing through alternative channels, like electronics stores and general retailers, as well as through resellers, agents, and third-party telemarketers. Unefon, in particular, draws its strength from unique distribution methods. It uses more than 1,000 electronics stores dedicated to selling appliances on credit. Telcel's distribution network is the most pervasive in Mexico and its "Amigo" prepaid kit is widely known.

Wireless carriers are expected to increase the use of alternative distribution channels in the future. Last year, carriers' sales through indirect channels grew markedly and they are expected to increase next year through other distribution channels, such as catalog showrooms, home office stores, warehouse clubs, and on-line Internet Web sites.

Fraud

Despite the best efforts of the operators, the war against fraud remains a notable phenomenon in Mexico's wireless sector. The growing number of digital networks are arguably more secure against fraud than analog cellular services and cloning has been reduced by sophisticated anti-fraud software. Nevertheless, internal fraud remains a problem and carriers continue to look for innovative ways to reduce it.

Future Market Trends

Fixed/Mobile Convergence (FMC)

A number of research firms have noted that until recently, Mexico's mobile operators have focused their attention mainly on mobile communications, as opposed to combining mobile with other services such as local or long-distance telephony, a strategy employed by operators in many other countries. A notable example is Telefonica which, despite combining fixed and mobile operations in many other Latin American countries, chose to spin off an exclusively wireless division in Mexico, Telefonica Movil.

The year 2000 marked the early stages of fixed/mobile convergence in Mexico. In its

broadest sense, convergence in the communications industry means combining various services--voice and data transmission (including Internet access), video, cable TV and/or other multimedia broadband applications--into a single package. Fixed/mobile convergence (FMC) is part of this larger integration movement, and means the offering of fixed and wireless in the same service package. Mexico's wireless operators are poised to provide services ranging from text messaging to video to Internet access. Their strategy is to compete with fixed line companies in Mexico like Alestra and Avantel. IUSACELL, for example, has formed a number of subsidiaries since the late 1990s, including Satelitron (data communications) and IUSATEL (long distance).

FMC allows operators in Mexico to manage only one core network and one set of services common to both mobile and fixed users. It also allows customers to have a single access device independent of the network. At present, demand for voice services in Mexico is driving the integration of fixed and mobile services. However, as mobile data evolves, it will play a greater role in the convergence movement. Although FMC will present many opportunities for Mexico's telecom carriers, it will also present dilemmas, most notably whether to become an integrated content provider or stay with basic services.

Next Generation Wireless

While voice services remain dominant in Mexico's wireless services market, the shift in traffic from voice to data is widely expected to permeate wireless communications over the next 5-10 years, as increasing numbers of users require access

to high-speed data and multimedia applications. Second and third generation (2.5G and 3G) technologies make high-capacity, high-speed data (including multimedia) and Internet connections possible over mobile devices. These advanced networks allow seamless switching of wireless calls from data-ready, hand-held devices seeking access to the Internet, ultimately designing an entirely personal mobile service package to suit the customer's needs. In the future, such services are considered vital to the continued growth of wireless operators' revenue and subscriber base.

Mexico was among the first markets in Latin America to roll-out 2.5G services. Telcel, IUSACELL, and Pegaso have all taken steps to deploy 2.5G network services. While not as yet ubiquitous, wireless applications to query databases and access e-mail through cellular modems and phones are now available in Mexico. Mobile operators in Mexico introduced WAP services in 2000 and plans exist to migrate networks to 2.5G platforms in support of further deployment. Telcel is currently the industry leader, having signed a contract with Ericsson for a GPRS/GSM network in 2000. In September 2000, Telcel launched data services on an upgraded CDPD network which allows data transfer at speeds of 19,200 kbps. Handsets for Telcel's upgraded 2.5G network are expected by early 2002.

Other operators are following suit. All operators using CDMA (except Telcel) are expected to have 2.5G services available before the end of 2002. The CDMA market leader for data is currently IUSACELL, the first operator to introduce WAP services on a Lucent-supplied digital network. As the

use of data expands and the number of high-use customers increases, competition will grow more fierce, particularly between Telcel's TDMA network and Pegaso's and IUSACELL's CDMA networks.

Wireless data services are expected to continue at a low rate of growth for another few years, due to the relatively slow transmission speeds on existing networks and relatively high costs. However, data transmission is expected to comprise an ever-increasing portion of the future wireless services market. Predictions are that the wireless data market will accelerate rapidly as access devices become more prevalent and affordable. Pyramid Research predicts that 11 percent of Mexico's subscribers will be using 2.5G-enabled services by the end of 2005.

In order to meet the continued shift in demand toward wireless data, operators have been making plans to evolve their networks towards 3G services with progressively faster data speeds. Pyramid Research predicts that about 2 percent of Mexico's mobile subscriber base--about half the non-prepaid subscriber base--will be using 3G-enabled services by 2005.

Additional Wireless Applications and Trends

Telemetry: The application of wireless telemetry, a relatively recent phenomenon in Mexico, is starting to grow. Much of the development in telemetry has focused on automatic meter reading and vehicle tracking, and there will also be continued growth in this mobile data application. Growth will be driven by the convergence of wireless, computing, and Internet technologies and the need for wireless

service providers to diversify their revenue streams.

Instant Messaging: Once 2.5G becomes more ubiquitous, the market for instant messaging will widen to users of hand held computers and mobile phones in Mexico. Analysts claim that within five years, the interface to most cell phones and wireless PDAs will include a buddy list which will transform the way people communicate by replacing the number of routine real-time, two-way phone calls.

Mobile banking (M-banking): While still in its infancy, mobile banking is the next logical step in advanced wireless services in Mexico. Financial institutions and network operators have both seen the opportunities afforded by offering mobile financial services and are currently driving the market with identical objectives: to bind tightly their relationships with existing customers in order to extend their mass-market reach and to target lucrative sectors. After adopting phone banking and e-banking, using a mobile device to manage their finances should seem a reasonable proposal for customers.

Wireless Market Potential

Increased competition, capital contributions from foreign partners, and needed regulatory reforms take center stage when discussing the future of Mexico's wireless market.

- As already noted, competition for additional subscribers will grow and become increasingly fierce. While competition in each service region is currently limited to two operators, many analysts predict that Mexico will see three to four operators in

each region by 2004. In the near term, operators will continue to shift focus to lower-income segments of the population to grow their subscriber bases. As 2.5G takes hold, high-end business users will help stem anticipated losses in Average Revenue Per Subscriber (ARPS).

- Now that Mexican wireless operators all have international patrons, additional investments in network equipment are assured. These foreign owners will want to grow their investments to keep pace with the introduction of new technologies by their competitors. As this decade progresses, expenditures will go increasingly toward the build out of 2.5G and, eventually, 3G networks.
- The strength and timing of regulatory reforms from COFETEL will also be a market determinant. COFETEL has vowed to address operators' complaints that they are disadvantaged by interconnection rates. Regulators have also promised guidelines for 3G development once spectrum harmonization issues with the United States are sorted out.

Services

Revenue from mobile services reached an estimated \$3.0 billion in Mexico in 2000. Service revenues are expected to reach between \$8.0-9.0 billion by 2005. While this represents a CAGR of about 45 percent since 1996, it lags behind the more than 90 percent CAGR of wireless subscribership in the same time frame. This is due to a decline in minutes of use (MOU) in recent

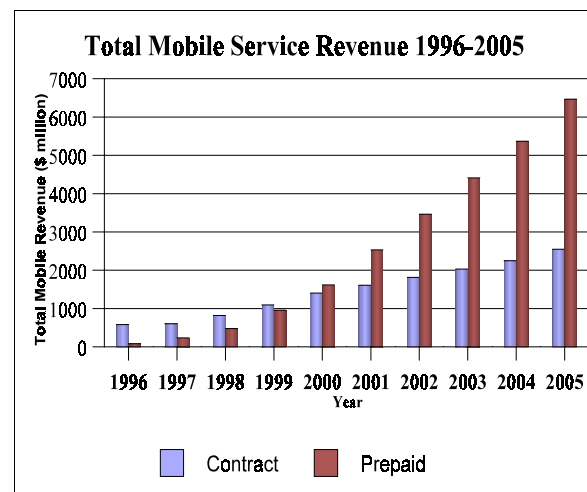


FIGURE 2-7. Source: Pyramid Research

years. Average monthly usage by Mexican subscribers dropped from about 144 minutes in 1996 to about 80 minutes in 2000 and ARPS has declined from \$64 in 1996 to \$23 over the same period. Pyramid Research attributes this to the increased percentage of prepaid users, who use minutes more sparingly. Pyramid predicts that ARPS will increase by a CAGR of about 3 percent between 2001 and 2005 due largely to the introduction of additional 2.5G and 3G services.

Since their introduction in 2000, an increase in the use of valued-added services (VAS) like voicemail has already helped stem declines in service revenues for some operators. Along with a larger wireless customer base, VAS have helped level off the decline in MOU, and projections are for modest increases. Between 2001 and 2005, Pyramid estimates an increase in MOU of about 1 percent for prepaid and 2 percent for contract subscribers. The increased availability and use of roaming and flat rate fees for long distance should also help.

The importance of the mobile services portion of Mexico's communications sector will continue to grow, and suppliers will benefit from plans to introduce next generation services. There are no additional spectrum auctions currently planned in Mexico, although the possibility exists that COFETEL may choose to re-auction some of the licenses that were not pursued in the 1998 auctions (notably those held by Midicel, which ultimately failed to pay for the licenses). In any case, there appears to be little demand for new frequencies. Unefon, for example, which has 30 MHz in each of the nine regions, reportedly said it does not see a need for new frequencies to offer 3G services at the present time.

Equipment

Wireless systems generally consist of: switching equipment; base stations (area transceivers); multiplexors (in digital systems); microwave transmitters (linking base stations to central switches); towers; energy delivery systems; rectifiers (AC-DC converters); remote site batteries; monitoring/control/support equipment. With 2.5G and 3G networks, additional equipment is required, including routers, support nodes, software, and application servers. Switching equipment is usually the high-end component of a network. Terminal equipment--voice handsets and wireless handheld data devices--form the other component of the equipment market (see FIGURE 2-8 for a comparison of handset shipments by standard).

In Mexico, as in other markets, wireless infrastructure systems tend to be sold in a package. If a cellular service provider buys a cellular switch, it is often from the same company that sells the radio base stations,

digital compressors, and other basic system components. The chances are strong that subsequent switches will come from the same company. Thus, it is partly the nature of a wireless market that technological compatibility conspires to limit the free entry of competitors.

Equipment suppliers to Mexico's wireless sector have included Motorola, Ericsson, Nortel, Lucent, Alcatel, Nokia, Samsung, and NEC. Ericsson's has been predominant of late, thanks to its close relationship to TELMEX and Telcel (as noted, Ericsson is deploying Telcel's GPRS/GSM network). Ericsson's product technologies are developed in Sweden and manufactured by a largely Swedish-owned company in Mexico. Given that Telcel is expected to remain dominant in the market, Ericsson will likely

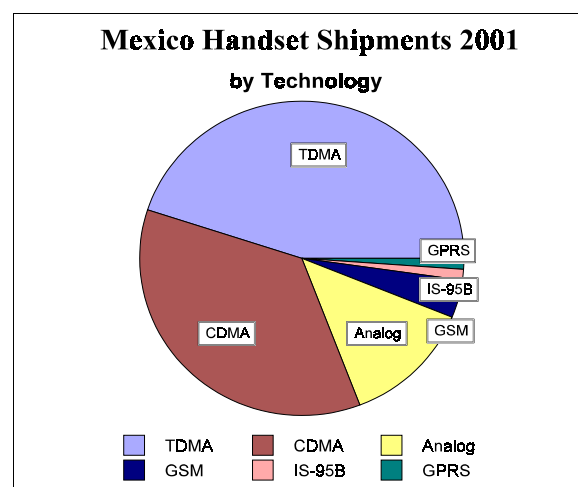


FIGURE 2-8. Source: Pyramid Research

remain a dominant equipment supplier through 2005. Further, since all Telcel purchases are centralized in Mexico City, Baja California operatives in the company who have stronger exposure than other Mexican engineers to U.S. technology will have little influence over the technologies

chosen by Telcel.

To date, Lucent's role in the Mexican market has been mainly as a supplier to IUSACELL. Lucent has seen its role as a supplier diminished somewhat recently, however, it stands to benefit from increases in equipment required for the wireless data market. Nortel, a latecomer to the market, became a prominent wireless supplier in Mexico in the late 1990s when it targeted wireless local loop providers and recently the company solidified its position by signing a contract valued at \$480 million to build Unefon's CDMA network. Attractive financial incentives reportedly helped win the award for Nortel. Alcatel supplied the original switches for Pegaso's network but Ericsson's CDMA Division (acquired from QAULCOMM) took over in July 2000, when it signed a \$200 million expansion contract. Motorola continues to be a major equipment supplier to a number of Band A licensees.

Pyramid Research predicts that more than \$7 billion will be invested in Mexico's mobile infrastructure between 2000 and 2005, ranking it only behind Brazil in wireless infrastructure investment. An estimated \$1.6 billion of this amount will go toward investments in equipment to upgrade to 2.5G. While Pyramid believes that about \$640 million will go toward 3G generation equipment, it is possible that this figure will be lower due to slower than expected progress on decisions regarding 3G spectrum technology. During this period, capital expenditures will peak around 2002-2003, and then decline until it becomes clear which way Mexico will go with respect to 3G (Mexico continues to watch for signals from the United States before deciding how to proceed).

Despite the limitations cited above, the increased use of wireless in Mexico should benefit U.S. manufacturers. An important determinant of the future success of U.S. cellular technology in Mexico will likely be whether Telcel is forced to compete for concessions in the future.

However Mexico's telecom market may evolve, wireless will continue to be a dominant player. While the high growth rates seen over the past five years are not sustainable, subscriber increases will remain high for the next couple of years. Continued development in wireless, however, is tied to the continuation of Mexico's overall economic development. Over the next year, this will have to come mainly from Mexico's domestic economy due to the slowdown in the U.S. economy. In spite of this, the increasing integration of the U.S. and Mexican economies will help grow Mexico's wireless market in the long run.

CHAPTER 3: INFORMATION TECHNOLOGIES (IT): Computer Hardware, Software and the Internet

COMPUTER HARDWARE

Personal computers make up the bulk of the Mexican computer hardware market. Demand continues to grow in all segments, particularly in the small businesses and home use markets. Although the public sector market is small, the Mexican government is trying to place computers in all government offices, further spurring demand. The Mexican Government (GOM) has instituted several programs to stimulate the use of IT throughout the economy. (For details on these programs, see CHAPTER 4.)

Most components used in computer hardware manufacturing are imported as there are relatively few local suppliers. However, this trend is changing. IBM, for instance, has made a conscious effort to work with and help develop local suppliers.¹ Guadalajara, known as the “Silicon Valley of the South,” is home to U.S. and other foreign contract manufacturers (CMs) that assemble imported parts for re-export to the United States. These CMs are developing relationships with local computer producers, and may end up supplying them in the long-term. SCI Systems, which set up its first plant in 1987, is the largest CM. Since then,

many other large CMs, such as Flextronics and Soletron, have established plants in and near Guadalajara, seeking to lower costs and establish just-in-time delivery systems required by their customers.

The importance of U.S. firms’ IT operations in Mexico and the role of these operations in the firms’ global strategy is increasing. One factor spurring this trend is that local assembly of components in the *maquiladora* sector is being increasingly incorporated into the Mexican economy under NAFTA. *Maquila* plants were originally set up exclusively to process (assemble, or complete a part of the manufacturing process) imported components for export. Companies such as IBM and Hewlett-Packard (HP), both of whom have been in the Mexican market for more than 20 years, have integrated their Mexican facilities (including their *maquila* plants) into their global operations. Another example of Mexican IT operations importance in global strategy is the fact that several firms, such as HP, Lucent and IBM, are conducting research and development in Mexico. In addition, R&D activity in Mexico is likely to expand due to the fact that CMs are often required to assume design responsibilities.

Personal Computers (PCs)

Leading suppliers of PCs in the Mexican market are Compaq, Acer and IBM, in rank order. IBM, Hewlett-Packard and Acer all produce for the Mexican market and for export. Most computer production involves

1. *Impacts of Economic Integration on the Computer Sector in Mexico and the United States*, Jason Diedrick, Kenneth L. Kraemer, Center for Research on Information Technology and Organization (CRITO), University of California, Irvine & Juan J. Palacios, University of Guadalajara, 1999, page 17

the assembly of circuit boards and complete PCs. Although computer production, including parts and subassemblies, takes place throughout Mexico, Guadalajara accounts for a majority of computer output. According to estimates from International Data Corporation (IDC), the value of the PC market was \$2.1 billion in 2001, up 6 percent from 2000 and is only expected to grow to \$2.2 billion in 2002. The highest proportion of Mexican IT spending is projected to be in this area and will represent more than a 30 percent share of total IT expenditures through 2005. The compound annual growth rate (CAGR) in PC expenditures over this period is expected to be 5.9 percent.

According to the Mexican Association of the Information Technology Industry (AMITI), spending is much higher on non-networked computer equipment than on networked equipment. This is a result of an inadequate telecommunications infrastructure which limits companies' abilities to link systems together over private networks or the Internet. Unfortunately, a lack of networking capacity generally leads to less productive production processes, inhibiting not only manufacture of computers, but Mexican production in general.

Manufacturers of PCs in Mexico include, but are not limited to, the companies listed in the TABLE 3-1 on the following page.

In addition to these manufacturers, there are "non-branded" white-box assemblers which include retailers and distributors that offer customers parts and subassemblies or a completely assembled PC. These white-box assemblers compete mainly with Lanix and Alaska and, along with other factors,

have helped bring down PC prices.

Stimulating Demand - The Mexican installed base of PCs was 6.3 million units in 2000 and has been growing at an impressive rate of at least 20 percent per year since 1995. The market for PCs in Mexico is highly competitive with all the major manufacturers competing for market share. The biggest impediment to increased PC use is an annual average income of about \$5,000 per year. In 2003, under the terms of NAFTA, used computer equipment was supposed to be allowed into Mexico duty-free. However, it appears that the GOM may request an extension on this date. If an extension is not granted, imports of used computer equipment may further stimulate demand by driving down prices. Manufacturers and retailers have developed several strategies to increase demand and provide financing options in order to increase sales. As more PCs are purchased through creative financing plans and innovative marketing techniques, IT adoption will move further down the socio-economic ladder.

One such program consists of telcos and Internet Service Providers (ISPs) selling computer equipment to their customers at monthly rates up to \$50, including Internet access. At the end of two years, the customer owns the computer. TELMEX finances Hewlett-Packard, Acer, IBM and Apple computers under such an arrangement and sells them to its fixed-line customers through payments made with the monthly phone bill. America Online (AOL) Latin America and Terra Networks, both ISPs, and an Internet portal company, Todito.com, also sell computers to their customers.

TABLE 3-1

MANUFACTURERS/ASSEMBLERS OF PCs/PERIPHERALS IN MEXICO		
Manufacturer	Plant Location	Operations/Comments
Samsung	Tijuana	Planned production of 600,000 units during 2001. Samsung plans to introduce a 48-hour delivery system for standard and custom-built systems through the use of just-in-time (JIT) manufacturing, in conjunction with UPS. Other manufacturers may follow Samsung's JIT plans if this company improves its market share.
Acer, or Acer Computec Latino America, (ACLA)	Mexicali, Baja California Ciudad Juarez, Chihuahua	Entered the Mexican market in 1990. The Mexicali plant produces monitors and the Ciudad Juarez plant produces PCs. ACLA is headquartered in Mexico City and has an assembly plant close to the city.
IBM	El Salto, Jalisco Guadalajara	Desktop PC and notebook manufacturing facility. Facility in Guadalajara is new. Also produces PC servers and disk drive components in Mexico.
Lanix	Hermosillo, Sonora	Local PC manufacturer; started operations in 1990 and has the largest share of the PC market by a locally-owned firm. Over 80 percent of its PCs are sold in Mexico and the rest are exported to Latin America.
Alaska		Local PC company financed by Mexmal and Dinastia, Inc. Mexmal is headquartered in Monterrey and directs the development of computer clones and computer equipment. Alaska has partnered with Chenbro of Taiwan to manufacture new generation entry level servers. The company plans to expand sales beyond the Mexican market, first to Central America and then to Brazil. The company has a good distribution network throughout Mexico and is estimated to have about 10 percent of the PC and server markets.
Hewlett-Packard	Guadalajara	Produces Deskjet printers

Sources: Compiled from various sources, including CRITO and USDOC-Mexico International Market Insights (IMI).

AOL, which began Internet service in Mexico in July 2000, teamed up with Compaq Computer Corporation and Banamex (the number 1 bank in Mexico) to sell computers with Internet access. Banamex credit card holders can buy computers with Internet access for a small down payment and 24 monthly payments of \$55. Other computer purchase plans are similar in nature.

Another innovative plan was started in 1995 by IT-related companies, mainly involved in leasing equipment. These companies established Acyber-cafes@ in some of the

more affluent neighborhoods in Mexico. Patrons can get coffee, use a computer, or bring their laptop to hook up to the Internet. Sun Microsystems and AOL Mexico are also supporting cyber-cafes with infrastructure and technology. Many of these establishments also sell computer equipment and offer financing, installation and after-sale service support. These facilities also offer the opportunity for Mexican youth that cannot afford their own computer to have access to a computer and to the Internet. There were 500 registered cyber-cafes in 2000, with up to 4,000 total in operation.

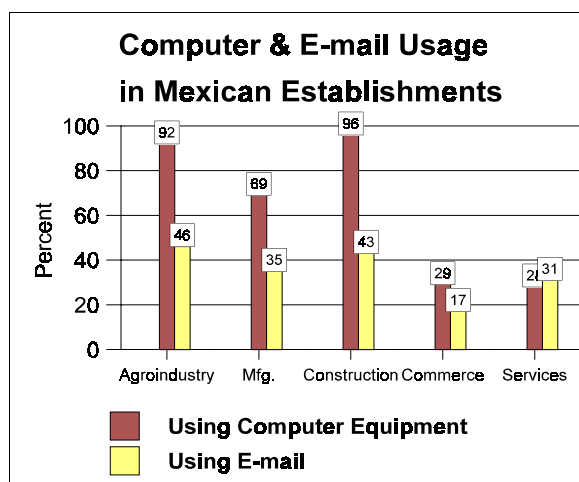


FIGURE 3-1. Derived from INEGI 1999

Although the number of firms with computers in the Agroindustry and Construction sectors is over 90 percent, as illustrated in FIGURE 3-1, other sectors of the economy have low computer penetration. The use of e-mail is below 50 percent in all sectors shown. However, more Mexican companies are expected to invest in IT as larger firms are reportedly putting pressure on their downstream business partners to increase their use of IT. Therefore, adoption of increased IT usage is more reactive than proactive² and is geared more toward business processes rather than business transactions. Companies wanting to sell in Mexico need to convince their customers that buying a new computer will increase their revenue, reduce operational costs, grow their client base, and in general, help them to compete more effectively in the marketplace.

PC Sales Channels - Although computer manufacturers offer on-line sales, this sales

channel has not been extremely popular as people still lack confidence in on-line security. Many Mexicans are hesitant to give out credit card information via the Internet, and credit card usage in general is very low. Wholesalers continue to be good sales channels for computers and related equipment, even though their share of sales may be diminishing as a result of on-line sales. Other sales channels mentioned previously include cyber-cafes, telcos, and ISPs.

Computer Servers

Sales of servers continue to grow, driven by rapid growth in Internet use and by the increasing adoption of technology by Mexican businesses, and are likely offer export opportunities for U.S. firms. Compound annual growth rate predictions through 2005 range from 3.2 percent for mid-range servers to 10.9 percent for low-end servers.³ Compaq and IBM are the largest vendors of servers, with Hewlett-Packard, Acer, Dell and Intel also supplying the market.

Other Computer Equipment

A wide range of computer-related equipment and components are produced in Mexico including motherboards, PC boards, disk drives, computer keyboards, printers, and monitors. The demand in Mexico for add-on storage devices is projected to grow at a CAGR of 21.8 percent from 2001

2. Mexican Association for Electronic Commerce (AMECE), Dr. Victoria Erosa, interview on September 28, 2001.

3. "IDC Worldwide Black Book", 2001, December 2001 update.

through 2005⁴, as more small and medium-sized firms increase their use of more data-intensive software and engage in e-commerce. Sales of networking equipment are vibrant, particularly for use in intranets (sales of equipment for extranets are low since they are not widely used yet). LAN (Local Area Networks) hardware will also provide good export opportunities for U.S. producers as small to medium-sized enterprises expand their use of PCs. Increased use of servers, connected via LANs, is seen as a way to cut costs associated with licensing software for individual PCs.

SOFTWARE MARKET

IDC valued the Mexican software market at \$632 million in 2001 and expects it to decline slightly to \$631 million in 2002. Software spending is expected to recover slightly in 2004, and remain flat over the next two years. The majority of expenditures in the software arena are for applications software rather than for systems software. The compound annual growth rate (CAGR) for spending on application software is projected to be only 1 percent through 2005. Sales of systems software is expected to decline by a CAGR of 3.4 percent through 2005.

The software market in Mexico is very competitive, with most major U.S. and other foreign software developers selling in the market. More than 90 percent of packaged software sold in Mexico is imported, mainly from the United States, according to the U.S. Commercial Service in Monterrey, Mexico. Primary Mexican manufacturers of

packaged software are Aspel, Computacion in Accion (COMPAC) and Vital, which have about a combined 5 percent market share. One example of a local firm producing packaged software is COMPAC, which produces bilingual, multicurrency, accounting software for small businesses. COMPAC is illustrative of a typical Mexican software developer, producing a software package aimed at a specific function that can be applied to a wide range of industries.⁵ Packaged software is sold through retailers such as Office Depot and Office Max.

In contrast to packaged software, more than 90 percent of customized software is developed in Mexico.⁶ According to several industry analysts, customized software is popular in Mexican businesses because it can be less expensive than enterprise resource planning (ERP) software and many high-end business application packages. Customized e-commerce solutions, such as e-procurement and supply chain management software, also are growing in popularity. These applications are sold both as packaged and customized solutions in the Mexican market. Companies producing customized software conduct product localization and other custom development for their clients who tend to be larger firms such as banks, multinational corporations, or firms in the manufacturing sector.

One notable exception to U.S. dominance in the Mexican software market is Sofftek, a Monterrey-based company. Sofftek is a leading software developer and is also the

4. *Ibid.*

5. CRITO, page 20.

6. *Computer Software*, U.S. Department of Commerce, Monterrey, Mexico, July 26, 2001.

largest Mexican customized software firm. The company also has operations in Latin America, the United States and Spain. Sofftek began as a supplier of software services and support to medium and large companies and now develops and adapts software for its clients in the financial, health care, government, telecommunications, manufacturing, retail/commerce, and services markets. IBM develops software in Mexico for its computers manufactured in Guadalajara. It also operates a foundation that works with local universities to help train developers, giving it access to the best of local software talent.

Mexican businesses use a wide range of business software applications. Because Microsoft's operating system is the predominant systems software used, software programs that are compatible with this software will be easier to sell than other programs. Other more industry-specific software applications are also used. More and more large and medium-sized Mexican companies are using ERP software to automate many of their core functions and

to develop business intelligence programs. Other more industry-specific software applications are also used. More and more large and medium-sized Mexican companies are using ERP software to automate many of their core functions and to develop business intelligence strategies. During economic slowdowns, such as Mexico is experiencing now, many companies tend to focus on their core business functions, and ERP software aids in this process.

TABLE 3-2 shows the major end-users of software in Mexico. The financial and manufacturing sectors are the largest users, most likely due to foreign investment in these sectors, primarily by U.S. companies. Although the smallest sector, government agencies are the fastest growing customers for software sales.

Application service providers (ASPs) are more popular in Mexico than in the United States. They are also more profitable than in the United States. Since most small firms in Mexico do not have an IT department, they find it easier to go to an ASP, which is less costly, in some cases, than actually

TABLE 3-2

Vertical Industry End Users of Software in Mexico in Rank Order (Based on Number of Software Packages Used)	
Financial Sector	banks, stock brokerage houses, insurance companies
Manufacturing Sector	over 100,000 manufacturing companies; many are subsidiaries of foreign firms
Retailers	
Government Agencies	best chance for upgrades due to E-Mexico program; need development software
Educational Sector	largest installed computer base at ITESM - Monterrey Institute of Higher Studies

Source: Derived from *Computer Software*, U.S. Department of Commerce, Monterrey, Mexico, July 26, 2001

purchasing the necessary hardware, software and storage to handle certain applications themselves. For example, one company, ASP bCentral, provides Manufacturing Resource Planning (MRP) and Customer Relationship Management (CRM) software to their customers via the Internet, along with other services. Other traditional back-office and ERP vendors are developing ASP-enabled versions of their software. Complete ASP solution providers that allow businesses to rent software applications and storage space are in demand. Small and medium-sized enterprises will provide excellent growth opportunities for U.S. ASPs in Mexico.

The Mexican Association of Information Technology Industries (AMITI) has recently initiated an effort to develop a software industry in Mexico. A plan was presented to the GOM and the Mexican Ministry of Economy, with the support of President Fox, to work to provide a conducive atmosphere for Mexican software development. The Ministry of Economy will be in charge of the project and, in conjunction with AMITI, has established seven working groups that are in the beginning stages of developing their programs and responsibilities. Although details are sketchy at this time, efforts under this program may provide additional opportunities for U.S. software developers.

Although the Mexican software market can be a lucrative one for U.S. firms, Mexico's software piracy rate (56 percent in 2000) can pose problems for software suppliers. Losses due to software piracy in Mexico increased from \$134 million in 1999 to \$180 million in 2000, according to the Business Software Alliance (BSA), a U.S. trade association. The GOM claims it is difficult

to prosecute piracy cases because software companies often drop charges in exchange for a share of profits from illegal software sales. In addition, many users claim that software prices in Mexico are often higher than U.S. prices and feel that they are being subjected to price gouging. Resellers involved in piracy are being identified and prosecuted. As a result, many software pirates have taken measures to legalize their programs and systems.⁷

Nonetheless, piracy has been difficult to eradicate. Many pirated programs costing \$1,000 or more in the United States can be bought for about \$10 off the street in Mexico City. Most small businesses claim they cannot afford to purchase a separate software license for each PC they own, and therefore replicate the software on numerous PCs illegally. Efforts to crack down on piracy of Microsoft programs have led some users to download open source software, such as Sun's free StarOffice. Use of pirated software will probably continue for home use which is more difficult to identify and prosecute.

INTERNET

The Mexican Internet penetration rate was projected to be 3 percent of the population in 2001 and to grow to 10.6 percent by the end of 2005.⁸ Estimates of the number of Mexican Internet users in 2000 range from

7. *Software Piracy Continues Growing*, U.S. Department of Commerce, Mexico City, June 21, 2001.

8. "Communications Markets in Mexico", Chapter 6: Internet and Media Markets, Pyramid Research, The Economist Intelligence Unit, Ltd. (EIU), July 2001, page 105.

2.7 million⁹ to 4.7 million.¹⁰ This user base may grow to 11 million by 2003, an optimistic prediction by Tecnofin (a Mexican Internet site development company), or by 2005, a more conservative projection by Pyramid Research. Growth beyond 2005 may be limited to 20 to 25 percent of the Mexican population due to income distribution patterns. With a current population of more than 100 million, this would mean that there is a potential Internet user base of at least 20 million, implying that there is much room for growth in Mexican Internet use.

Major factors currently limiting Mexican expansion of the Internet include the low percentage of people with sufficient disposable income, which restricts the size of the market and results in a low PC penetration rate, and a lack of fixed line capacity which prevents potential customers from gaining access. The effect of these barriers is that Internet use will, in the short-term, remain limited to larger companies, educational institutions, and a small base of home users. Most industry literature indicates that only 5 percent of Mexicans own a computer.

Over the long-term, Internet use is expected to increase as the process of technology diffusion continues, moving from larger companies to their suppliers, from institutions of higher education down to secondary and primary schools, and from the Mexican federal government out to local governments. Private and public sector

initiatives are constantly being introduced that will boost Mexican Internet access and adoption. For example, TELMEX launched a public Internet service initiative in April 2001 that consists of establishing card-operated booths which will allow customers areas such as airports and shopping malls, to use prepaid long-distance cards (\$0.053 per minute) for Internet access. These "Internet stations" are being installed in entertainment centers.¹¹ TELMEX's project and the increasing use of cyber-cafes are offering increased accessibility to the Internet for many Mexicans. A major public sector project that will also stimulate Internet use is E-Mexico.

E-Mexico

In 2001, Mexican President Fox initiated the \$4 billion initiative, "E-Mexico," that is intended to foster Internet use in four areas: e-government; e-education; e-health; and e-commerce (See Chapter 4 for more information). Providing increased telecommunications and IT infrastructure is crucial to its success. Thousands of computers will need to be purchased and people will have to be trained how to use them. One of the plan's goals is to link 98 percent of the nation to the Internet. Part of this is to be accomplished by having large telecommunications carriers connect 10,000 communities by 2006. The Mexican government reportedly will provide funding of \$1.5 billion toward the project in 2002, but has suggested that the remaining funding come from municipalities and private investment. As of August 2001, only 250 communities had been connected to the

9. Government of Mexico and the International Telecommunications Union (ITU), *Information Technology Indicators*, 2001.

10. Pyramid, EIU January Alert 2, January 3, 2001.

11. *Communications Markets in Mexico*, Pyramid Research, EIU, July 2001, page 104.

Internet. If this plan is successful, there could be excellent opportunities for U.S. vendors of IT and telecommunications products and services over the next four years.

Infrastructure Development

There are three legs to the Internet backbone in Mexico with two international connections, one originating in Las Vegas (Sprint) and running down the western side of the country, and one coming from Dallas down the eastern coast. Both these lines meet in Mexico City and extend from there down the southeast coast. Lines running along the backbone run at speeds of 2.048 Mbits per second, and regional nodes run at 64 Kb per second. There are fifty-five national stations connected to backbone nodes in Hermosillo, Monterrey, Guadalajara, Puebla and Villahermosa. Mexico's fiber optic network has more than doubled from 26,595 miles in 1995 to 60,459 miles in 2000.

All Mexican Internet access is routed through Internet nodes in the United States. TELMEX's (Mexico's dominant carrier) backbone provides the main access to these nodes, but it does not have enough capacity to handle demand. Since TELMEX is the principal supplier of local lines and interconnection links to Internet service providers (ISPs), growth in the system depends on its ability to keep up with demand for access. To illustrate the problem caused by rapid growth in demand: in 1995, there were 15,000 Internet dial-up accounts; in 2001, TELMEX alone had over 1 million.

The majority of Mexican Internet access is through PCs. Plans to provide alternatives

to PC access through "smart" phones and other portable Internet access devices exist, but are in their infancy. Most Internet accounts will remain dial-up rather than broadband through 2005 according to Pyramid Research.

Internet Cost Factors

One factor which may boost Internet access growth and the time Mexicans spend online is the fact that Mexico does not have metered phone charges, as in many other Latin American countries. Mexican phone service is still expensive, and some ISPs charge for Internet service by the minute. There is proposed legislation, requested by ISPs in Mexico, that would define every 15 minutes of Internet time as one call. Analysts do not believe this proposal will pass, but it will be subject to negotiation between ISPs and regulatory authorities.

Potential users that can afford the costs of telephone calls, but cannot afford to pay an ISP, can get free Internet access. The number of free Internet access accounts will increase from 28 percent of total installed accounts in 2000 to 41 percent in 2002, according to IDC. However, free ISPs may run into financial difficulties since service cannot be maintained based only on advertising revenues. It is estimated that only 30 percent of free Internet users log in once a week, making the advertising model risky. Free ISPs will need to offer fee-based value-added services in order to survive.

The price of telecom services needs to be reduced further, which will make Internet access more affordable and make Internet expansion more feasible. TELMEX offers its customers the opportunity to buy a computer and have a one-year Internet

access account with Prodigy for about \$50 a month. However, TELMEX reportedly is unwilling to reduce costs to its customers, which would lead to growth in users and other types of services, and provide a larger revenue stream. TELMEX may be forced to lower prices in the future as increased competition and more Internet capacity will eventually bring prices down further. International Internet access prices will also fall when increased capacity from planned construction of additional underwater cables and satellite links is completed.

Internet Service Providers (ISPs)

There are more than 200 ISPs in Mexico, up from 29 companies in 1995. Prodigy, AOL Mexico, Avantel (Avantel is a long-distance carrier) and Terra (owned by Telefonica) are the main ISPs and represent 77 percent of the market (see FIGURE 3-2). ISP services are reportedly poor, mainly due to

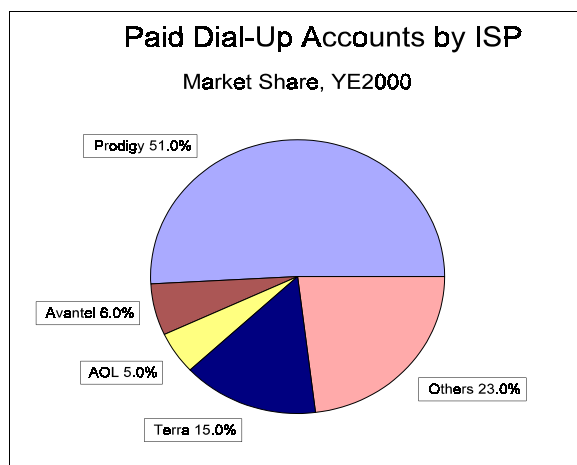


FIGURE 3-2. Source: Pyramid Research, 2001

overloaded circuits made worse by one million new users having been added to the ISP customer base over the last two years. Another problem is the near monopoly that TELMEX has over the Mexican market.

TELMEX not only has close to 95 percent of the country's local telephone lines, but its venture TELMEX/Prodigy has over 50 percent of the ISP market. TELMEX has the advantage of being able to bundle services which is something most other ISPs cannot do. ISPs sometimes have to wait months for additional lines and routing capacity.

TELMEX has suggested that ISPs go to some other local telephone carriers. However, many of these carriers are new, have limited networks, and many have to rely on TELMEX for routing to Internet access nodes. In addition, some of the new carriers' routing capacity is already saturated. Also, because of these factors, several of these local telephone carriers are facing financial difficulties. As a result, observers question whether TELMEX's competitors will be able to find financing to build out their networks.

Another problem with providing increased Internet access is the remaining restriction on foreign investment in telecommunications services which forces U.S. companies to partner with telcos to build out the network. Foreign equity in fixed wire services is limited to 49 percent. However, there are no restrictions on foreign investment in data services.

There is a proposed amendment to the Federal Radio and TV Act, proposed by the State of Chihuahua, which says that the Internet is equal and similar to TV. The amendment's internet-related provisions were intended to regulate pornography. If enacted, this legislation could result in a requirement for all ISPs to apply for permits to operate in Mexico. Currently, ISPs need only register with the telecommunications providers they use for access.

A legislative review of the Federal Telecommunication Law (due to be approved by the end of April 2002), currently underway, would also require ISP registration. The law contains an amendment defining ISPs as value-added service providers and would require them to register with COFETEL. The law also would require Internet Access Providers (IAPs) to obtain a permit from COFETEL prior to starting services. The Mexican Internet Advertising Association (AMIPSI - Asociacion Mexicana de la Industria Publicitaria y Comercial en Internet) is currently working on a report to define the difference between an ISP and an IAP in order to determine whether this permit requirement is necessary or not. And if so, under what conditions a permit should be required. AMIPSI's report is expected to be completed by the first week in April 2002.

Internet Hosts and Data Centers

The relatively fast expansion of the Internet in Mexico, growing interest in e-commerce, and increasing use of business applications are creating a need for hosting services with large storage capabilities. Companies that are capable of offering bundled packages of connectivity, hosting, and storage will eventually displace companies currently offering simple co-location and basic storage solutions for Web sites. According to Pyramid Research, revenues from web-hosting in Mexico are expected to grow at a compound annual growth rate of 34 percent, from \$150 million in 2001 to \$375 million in 2005.

PSINet and Diveo were among the first companies to enter the Web-hosting area of the Mexican Internet market, followed by Adetel and Dialtone. Telecom carriers in

Mexico have also moved into this market and have committed over \$200 million to construct data centers between 2001 and 2002. This move to diversify their businesses will shield telcos from future lower growth in revenues attributable only to Internet connectivity. TELMEX, Alestra and Avantel have all begun deployment of data centers and are planning additional construction. These companies, plus AXTEL and MCM Telecom, have also begun offering hosting services in their existing data centers.

Optiglobe is illustrative of a company offering a complete Internet service package that is needed in Mexico. The U.S. firm, which already provides Web-enabled IT outsourcing and data center services in Brazil, Argentina and Chile, opened up a facility in Mexico City that will be officially launched during the first quarter of 2002. It will offer the Mexican market a comprehensive portfolio of infrastructure, connectivity, and managed services. According to Optiglobe, its services will allow Mexican and multi-national companies to roll out and operate mission-critical IT systems faster, with lower costs and better quality than is possible in-house.

Broadband Internet

Broadband technology is not yet widely used in Mexico, although 40 percent of businesses in Mexico potentially have access to high-speed Internet according to eMarketer. Some graduate education programs and financial institutions also have broadband access. However, broadband is still very expensive, with installation charges of at least \$350 and monthly charges totaling \$50. Integrated Services Digital Network (ISDN) was the first

broadband technology used in Mexico, but its use is expected to decrease as TELMEX pushes its digital subscriber line (DSL) service. TELMEX launched DSL service in August 2001 (under the brand name Infinitum) in advance of any agreements over wholesale services being available.¹²

Whether TELMEX will upgrade the national network to DSL, as some of its competitors have feared, remains to be seen. Pyramid Research believes that DSL Internet service will grow faster than that of cable modem because telecom companies are in a better position than cable operators to offer bundled services (local, long-distance and high-speed Internet) at competitive prices. There are reportedly 10,000 DSL users.

Commercial cable modem service in Mexico was first available in 2000.

Although ten percent of Mexican households were connected to cable TV in 1999, only 15,000 customers were connected to cable modems in 2000.

Megapo launched high-speed broadband Internet access for its cable subscribers in five nodes in the Cuernavaca system in November 2000. Cable California, the Mexican operation of Las Americas Broadband, Inc., offers broadband services targeted at residents of Tijuana, Mexico through its ISP, OPTINET. The service is bundled with a premium cable television service and includes unlimited Internet access. Television networks are reportedly gearing up to provide more Internet access via cable, and this may represent a more realistic mode of broadband access. The Mexican TV network, Televisa, has plans to

develop Internet access via cable TV through its subsidiary, Cablevision (See CHAPTER 2: TELECOMMUNICATIONS). The connection charge for one company for cable modem was \$51.23 and the monthly fee was \$41.

TELMEX's opposition to the unbundling of its local loop is hindering further access to broadband Internet. However, it is reportedly considering line sharing with other telecom carriers who want to offer DSL. Since there is no infrastructure to compete with TELMEX, unbundling and line sharing for increased Internet access may become a more important issue for the Mexican government to resolve.

Unbundling and line sharing would provide more access to high-speed Internet services by other telecom carriers or ISPs.

Otherwise, the availability of DSL services will be almost totally under the control of TELMEX.

Wireless broadband may not become as widely used as other types of Internet connectivity as it will be extremely expensive for all users--consumers and businesses.

Wireless Internet

Wireless Internet use may become more widespread as a result of the serious infrastructure problems with the fixed line Internet. In 2000, use of cellular lines exceeded the number of wired lines.

Pyramid Research predicts that there will be 209,000 mobile Internet subscribers in Mexico by the end of 2001 and that this number will grow at a compound annual growth rate of 189 percent through 2005, to reach a total of 3.8 million mobile Internet subscribers.

12. *The Development of Broadband Access in OECD Countries, Working Party on Telecommunications and Information Service Policies*, 2001.

In July 2001, the first Wireless Local Loop (WLL) Internet service with speeds from 128 to 2,000 kilobits per second (Kbps), was launched by Telecomso. The company hoped to sign up six thousand subscribers by the end of 2001. Analysts are predicting that within five years, the spread of wireless Internet will be similar to that experienced with cellular phones (see CHAPTER 2: TELECOMMUNICATIONS).

Implementation of wireless networks would solve some of the problems involved in having to go through TELMEX for access.

Nearly all wireless operators offer different versions of Internet navigation via Wireless Application Protocol (WAP) and bidirectional messaging (see TABLE 3-3). One company, Biper, is marketing devices ready for Internet navigation and has upgraded its network for packet transport. Biper plans to expand its Movilaccess service to 50 cities by the end of 2001. This will mean more mobile phone Internet access will be available via packet transport than via WAP.

Internet content via mobile access, such as cell phones and pagers, is growing and becoming more varied. Mobile operators' portals offer basic messaging, weather and news. Companies that are more content focused, such as AOL, are introducing more comprehensive Internet services. Mexican AOL Mobile was launched in April 2001 and will eventually be available in the 17 cities where parent company AOL already provides ISP service.

Demographics

The majority of the Mexican population is concentrated in Mexico City, Monterrey and Guadalajara. Eleven Mexican states, each

having around 30 or more ISPs, are located mainly around Mexico City and close to the U.S. border. These states include: Coahuila, Baja Sur, Baja California Norte, Puebla, Queretaro, Veracruz, Guanajuato, Mexico, Nuevo Leon, Jalisco and Distrito Federal (Mexico City).¹³ Usage of computers and the Internet varies by geographic region. In Monterrey, which is an industrial as well as educational center, 19 percent of citizens use a computer every day for about 3 ½ hours.¹⁴

Business and home use of the Internet account for approximately 83 percent of Internet usage (see TABLE 3-4). Cyber-cafes are claiming a growing number of users. The number of people accessing the Internet from public locations increased from 98,000 in 1999 to 288,000 in 2000, and is expected to grow to 462,000 by the end of 2001.¹⁵

Internet usage is growing fastest in the 15-24-year-old age group, according to E-marketer. Users go on-line at least 10.9 days each month, spend an average of 11.4 hours on-line and visit 49.4 domains, according to NetValue. Most users are below 30, a very young user population (see TABLE 3-5).

Men dominate Mexican Internet usage accounting for 62.8 percent of all users, according to *eMarketer*, an online market research firm. Of these users, 85.4 percent are students and 4.1 percent are

13. *Internet Market*, U.S. Department of Commerce, Mexico City, 9/25/2001.

14. Reforma Group, February 2001.

15. Mund Americas, 2001.

TABLE 3-3.

WIRELESS INTERNET SERVICE PROVIDERS IN MEXICO		
Provider	Date Service Began	Comments
IUSACELL	March 2000	WAP; main cellular operator in Central Mexico
Pegaso	2000	Although 70% of its handsets have mini-browsers, only 1% of subscribers actually used mobile Internet services
TELCEL	2000	Largest wireless operator in Mexico
Biper (Movilaccess)		Packet transport
Telecosmo	July 2001	WLL; 128 to 2,000 kilobits per second
AOL	April 2001	

TABLE 3-4.

INTERNET USERS BY SECTOR				
	1998	1999	2000	Average Annual Growth
Government	31,000	167,000	193,000	446%
Educational	154,000	166,000	276,000	41%
Home	297,000	478,000	1,066,000	122%
Business	740,000	1,010,000	1,777,000	45%
Total	1,222,000	1,822,000	2,712,000	74%

Source: IDC-Select, December 2000

TABLE 3-5.

INTERNET USERS BY AGE		
	2001	2005 Estimated
Percent of Total		
13 - 17	16%	24%
18 - 24	32%	36%
25 - 29	30%	30%
30 - 49	12%	7%
50 +	10%	3%

Source: Mund Americas, June 2001

professionals. IDC claims that 20 percent of Mexican Internet users are “mature users,” male and 44 years old on average. This mature user has been connected to the Internet for 18 months, gets online six times per week and spends an average time online of two hours per session.

The top four categories of Mexican Internet usage in rank order are, (according to a June 2001 report by NetValue), Web searches, instant messaging, down-loads of audio and video, and e-mail.

Household Internet Use

Estimates of the number of home computers in Mexico in 2000, range from 2.5 to 5.8 million. According to a Nielsen/NetRatings report (*Global Internet Trends, Q2, 2001*), there are about 1.9 million Mexican households with at least one PC. However, this could increase as more consumers take advantage of PC financing offered by telcos and ISPs and as PC prices continue to fall. Greater PC penetration is one necessary precondition for the growth of the Internet in Mexico. According to IDC, household Internet use grew by 122 percent from 1999 to 2000. Web-TV and similar products are not used, and analysts do not believe they will be popular anytime soon.

Internet Use in Educational Institutions

Universities, such as Monterrey Tech (ITESM) and the National Autonomous University (UNAM) were early adopters of the Internet and sold access to both the Mexican public and private sectors. As part of a larger program, Proctor and Gamble is supporting an outreach program to reach college students. According to industry experts, use of wireless Internet may be the

future of Internet access for education, especially in rural areas.

Business Internet Use

Businesses are the most numerous Internet users. Larger firms, many of whom are subsidiaries of foreign firms, are the heaviest users. Most business use of the Internet is for e-mail. However, Internet use for supply-chain processes is becoming a hot issue. As with most use of IT by Mexican businesses, the Internet is used more for business processes than for transactions. Use of the Internet for B2B or B2C is not widespread (see CHAPTER 4 for more information), but is expected to spur further demand for Internet access as electronic commerce grows. According to IDC's *E-business Trends*, Mexican businesses planned to increase the percentage of their IT budgets spent on investments in Internet initiatives from 17.4 percent in 2000 to 27.1 percent in 2001.

The Mexican Government

The government is using the Internet for procurement, to enhance the productivity of its workforce, and to ensure that all its offices have a computer. The use of computers and the Internet in both the federal and state governments is quickly growing. However, funding is always a problem which affects the level of commitment to bringing more government services online. The government of the State of Jalisco is an exception. A majority of the country's computer production takes place in Jalisco, and the central state government is linked to the state's municipal governments through a network

platform operated via the Internet.¹⁶ Jalisco decided that if it wanted more IT companies to locate in its area, it needed to make the investment in IT infrastructure necessary to provide the type of environment such companies needed to manufacture their products.

The Internet in Rural Areas

Outside the urban areas, Internet use is limited due to geographic inequalities in teledensity. According to a U.S. Commercial Service report, *Internet Infrastructure Problems* (September 28, 2001), fixed line penetration in Mexico City is 33.4 percent whereas it is only 4.1 percent in the state of Oaxaca, one of Mexico's poorest states. Although very few Mexicans currently access the Internet via cellular telephones, this type of Internet access may represent hope for connection in many rural areas. As mentioned under the section on ISPs, local telcos have inadequate capital to develop some of these underserved markets.

16. CRITO, page 24.

CHAPTER 4: ELECTRONIC COMMERCE

The Mexican e-commerce market has the greatest potential in Latin America for growth due to its own industrial composition, the largest network of free trade agreements worldwide, strong trade ties to the U.S., and the Government of Mexico's (GOM) commitment to establishing a regulatory framework conducive to growth in e-commerce. Despite the fact that Internet access is still limited in comparison with other countries in the region, online transactions are growing at 400 percent annually, with a value of \$1.2 billion in 2001.¹ E-commerce in Mexico is expected to reach approximately \$38 billion by 2005,² which will represent 0.6 percent of the total Mexican economy.³ In addition, according to IDC, the percentage of overall revenue attributed to the Internet-related sales is the largest in Latin America, with an estimated 10.5 percent of all Mexican business revenue in 2001 resulting from online transactions.⁴

In many ways, however, e-commerce in Mexico is still in its infancy, with most Web

pages still strictly informational, and only showcasing products and services and/or providing contact information. In fact, there are only about 250 Web sites in Mexico that have transactional capabilities. And, even though most indicators point towards future growth in this area, the downturn in the Mexican economy in 2001 will cause difficulties for the growth of e-commerce--both in business to business (B2B) transactions, which are concentrated in manufacturing and processing--the sectors hardest hit by the economic slowdown--and in business-to-consumer transactions, which will suffer from possible declines in spending power and consumer confidence.

BUSINESS TO BUSINESS TRANSACTIONS

B2B e-commerce is more prevalent now and has greater prospects for future growth than business to consumer (B2C) transactions in Mexico. In 2000, B2B accounted for 77 percent of the total e-commerce transactions in Mexico⁵, and by 2005 it is estimated that it will reach 84 percent.⁶

Large multinationals and Mexican conglomerates have already fully implemented their B2B strategies, and are now extending them to smaller suppliers and offering incentives to get their smaller business partners online. Grupo Bimbo, for

1. Pyramid Research, "Communications Markets in Mexico: Blurring Barriers and Escalating Competition", (Economist Intelligence Unit, Ltd.) July 2001, p. 113.

2. *Ibid.*

3. U.S. Department of Commerce, "The B2B Market", International Market Insight, 2001, www.usatrade.gov.

4. Lori Enos, "Report: Internet a Growing Piece of Latin American Pie", *E-Commerce Times*, August 24, 2001.

5. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001.

6. Pyramid Research, "Communications Markets in Mexico", (EIU, July 2001) p. 113.

example, has instituted a program through which it provides financing for computers and Internet connections to its small suppliers. In addition, larger companies, such as WalMart, by doing business primarily with companies able to tap into their supply network, provide incentives for these small firms to move functions of their businesses online.

Traditionally, the biggest factors inhibiting B2B transactions in Mexico has been the lack of a legal framework to uphold online contracts. The E-Commerce Law (2000) represented a major first step towards rectifying this problem, and proposed legislation on e-signatures and e-invoices should improve this even further. See page 59 for more details on the regulatory and legal structure.

However, most of the issues affecting B2C transactions, such as weak consumer confidence, concerns relating to security, high credit card charges and low Internet penetration rates, have little or no impact on B2B.

BUSINESS TO CONSUMER TRANSACTIONS

According to Visa International and the Boston Consulting Group's third annual survey of e-commerce activity, B2C sales were \$134 million in 2001,⁷ yet B2C e-commerce accounted for only 23 percent of the total revenue generated by e-commerce

7. Calgary Herald, "E-Commerce to grow 137% in Latin America", *E-Commerce Times*, November 19, 2001.

in 2000.⁸ This number is predicted to decline in the next few years as the problems with the Mexican economy continue. However, Mexico ranks second in Latin America in percentage of people who shop online, despite its low Internet penetration rate of 3 percent (compared with 44 percent in the U.S.). This bodes well for future increases in B2C e-commerce since it is predicted that Internet penetration will rise to 10.6 percent by 2005.⁹

Web sites that are the most successful in the Mexican market are those that offer the fastest and most reliable delivery service and are targeted towards users with monthly incomes of less than \$550, reflecting both the small purchasing power of the Mexican consumer and the overall youth of the average Mexican Internet user. Thus, sites that sell low value objects, such as books or music tend to have the most success.¹⁰

Experts agree that the factors holding back B2C e-commerce in Mexico center on four main themes:

Internet Access Issues: Low Internet penetration rates stem from a general lack of sufficient telecommunications infrastructure. At just over 12 percent,

8. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001.

9. Pyramid Research, "Communications Markets in Mexico", Chapter 6: Internet and Media Markets, The Economist Intelligence Unit, Ltd. (EIU), July 2001, page 105.

10. In a survey of Mexican Internet users, Greenfield online found that hardware/software, CDs, and books were the top three product categories researched online.

Mexico's teledensity is the lowest in Latin America, which is a significant contributing factor to the low Internet access rate of Internet--only about 3 percent of Mexico's 100 million plus citizens have access to the Internet.¹¹ In addition, for those few who do have Internet access at home, the prohibitive cost of going online means that most people are not likely to spend the time needed to purchase goods on the Internet. Adequate access to the telecommunications infrastructure and more reasonable pricing for Internet use are both necessary for the growth of B2C transactions in Mexico.

Small Purchasing Power: With 85-90 percent of the wealth concentrated in only 20 percent of the population in Mexico, and the average monthly wage at \$120, the amount of people who can afford to purchase the kind of consumer goods available online is limited. Moreover, 78 percent of Mexican Internet users are under the age of 30, with less purchasing power than other demographics.¹² As this group grows older, their buying power will increase, and in turn, Internet-related revenue will grow.

Credit Cards and Banking System: Reluctance to use credit cards for online purchases continues to be another large obstacle to e-commerce. In fact, only 10 percent of all commercial transactions in

Mexico were made by credit card in 2000.¹³ Not only are credit cards expensive in Mexico--with annual interest rates as high as 65 percent--fear of fraud and theft is also a serious concern for both consumers and small businesses. One problem, in particular, is that consumers are held responsible for interest that accrues while credit card companies are investigating charges resulting from theft.

Consumer fear of online crime is compounded by a general belief among Mexican consumers that domestic security technology is insufficient to protect them from fraud or theft on the Internet. Most consumers in Mexico have a great deal more confidence in the security of European and North American Web sites, and therefore, are much more likely to buy goods from those sites. In fact, in 2000, 70 percent of online purchases in Mexico made on U.S. Web sites.¹⁴

Educational and Awareness Issues: Most people in Mexico still do not see the benefits of being online, and have not realized the potential of purchasing or selling goods and services via the Internet. While more small businesses seem to be moving at least their promotional sides of operations online, they generally do not see a compelling business need to establish a transactional Web site. Approximately 79 percent of the Mexican companies recently surveyed by Select-IDC that were planning on building a Web site

11. U.S. Department of Commerce, "E-Mexico: The Vision and Some Barriers", International Market Insight, June 2001, www.usatrade.gov.

12. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001, www.usatrade.gov.

13. U.S. Department of Commerce, "E-Commerce Market", International Market Insight, 2001, www.usatrade.gov.

14. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001, www.usatrade.gov.

had between 1 and 15 employees¹⁵.

A scarcity of basic IT-related education in schools further contributes to a lack of understanding about the importance of the Internet in the development of the economy. Living outside the “Golden Triangle” makes Mexicans even more unlikely to be online or sell their goods via the Internet, as teledensity, PC use and educational attainment diminish significantly outside the urban centers of Mexico City, Monterrey, and Guadalajara.

It is predicted that the obstacles detailed above, along with the downturn in the Mexican economy, will result in declines in B2C transactions in the near future. To address many of these issues, the Fox Administration developed a comprehensive program called the E-Mexico Plan.

E-MEXICO

The E-Mexico initiative is the Fox Administration’s attempt to turn Mexico into a digital economy. The plan, which was first suggested by the Asociacion Mexicana Para El Comercio Electronico, A.C. (AMECE) while the Fox Administration was still in transition, is a coordinated effort between government agencies and the private sector to develop Mexico’s IT industry, foster an internal market for IT products, promote an adequate regulatory framework in the use of electronic media and e-commerce, and to digitalize government services. Led by the Secretary

of Transportation and Communications and the Secretary of the Economy, the key end result of E-Mexico is to get 98 percent of Mexican citizens online by 2025.

The goal of the project, or its “vision”, is to achieve five main objectives:

1. Reduce the digital divide between Mexico and its major trading partners;
2. Reduce the digital divide between individual industries and sectors within Mexico;
3. Remove barriers to SME participation in the digital economy;
4. Use the educational system to produce a workforce trained in high technology, and;
5. Produce a state of the art legal framework for e-commerce, focusing on legislation related to e-signature/authentication, e-invoice, consumer protection, privacy, cybersecurity, and intellectual property rights protection.

The E-Mexico Plan relies on 17 strategies to accomplish these goals (see FIGURE 3-1), each of which is incorporated into the seven principal categories of development: telecommunications infrastructure, IT infrastructure, e-government, e-health, e-education, e-commerce and its relevance for small and medium-sized business, and an

15. U.S. Department of Commerce, “E-Commerce Market”, International Market Insight, 2001, www.usatrade.gov.

e-commerce legal framework.¹⁶

While the E-Mexico initiative is widely supported by both the government and the private sector, even some of the people closest to its development are concerned that the plan is too ambitious. Details on how all five goals and seventeen strategies will be realized within the current government structure are murky. Even though the GOM has managed to literally map out the functions of all the key GOM players of this massive undertaking, how they will work together is still unclear.

Since E-Mexico will not have its own separate budget, and each of the projects will be financed by federal and local government funds and private investment, another major concern with the program is that it will be difficult to come up with the \$1.5 billion the Fox Administration says is the minimum amount necessary to accomplish all of its goals.¹⁷ With the economic downturn, it seems unlikely that the resources currently exist to establish each of the government programs and services that make-up the 17 strategies, especially since analysts predict that Mexico's economic problems will make it difficult for the GOM to come up with the \$1.5 million it committed to the project for 2002. Unless enough private investment can be collected, it may be difficult to count on

there being enough resources to quickly resolve any of the problems set to be addressed by E-Mexico.¹⁸

While it is encouraging that the planners in the Fox Administration have set aside 25 years to complete E-Mexico, indicating a sense of realism about the size of this undertaking, it is clear that certain components must be completed very soon in order for Mexico's e-commerce market to expand. Perhaps most importantly, a legal and regulatory framework must be established to ensure the continued growth of B2B and to expand B2C. Fortunately, significant progress has already been made in this area.

16. Jesus Orta Martinez, "Programa Especial para el Desarrollo de la Economía Digital", Secretaria de Economía, October 2001.

17. The Fox Administration has said that it could cost anywhere from \$1.5-\$5 billion. Most private sector analysts are leaning towards the higher number. U.S. Department of Commerce, "E-Mexico System", IMI, 2001.

18. The good news is that the GOM has already begun to see some of this money coming in from the U.S., as U.S. companies have begun to contribute money and resources towards achieving E-Mexico's goals. For example, Microsoft donated \$58 million to train thousands of teachers and software programmers. Chris Kraul and Rafael Aguirre, "Microsoft Pledges \$58 Million to Get Mexicans Online", *The Los Angeles Times*, August 24, 2000, p. A3.

FIGURE 4-1

17 Strategies of E-Mexico

- Promote investment of original equipment manufacturing companies and suppliers
- Develop domestic IT industry
- Develop human capital according to the needs of the IT industry
- Create a favorable business environment for software development to attract investment
- Support the domestic software industry
- Increase domestic demand for software and other IT products and services
- Provide financing to SMEs to encourage implementation of IT into their business processes
- Promote the use of IT in the administrative systems of SMEs
- Develop training programs for business on the benefits of IT
- Integrate public companies into digital supply chains
- Finance projects focused on the development of digital supply chains
- Develop skills in both managers and staff to administer digital supply chains
- Reform legislation to support the use of electronic, optical or any other IT media
- Use the GOM as a model in the use of IT
- Facilitate industry access to key information on how to use IT
- Reform regulations to include digitalization of government paperwork and services
- Support the transformation of digital processes in the government agencies that offer services to private companies in coordination with the e-government program.

Source: Jesus Orta Martinez, "Programa Especial para el Desarrollo de la Economía Digital", Secretaria de Economía, (October 2001)

FIGURE 4-2

Mexican Legal Background

• Commercial Code 1889	- Telegraph
• Civil Code 1928	- Telephone
• Banking Law 1990	- Electronic Bank (ATMs)
• Consumer Law 1992	- Telemarketing
• Federal Tax Law 1998	- Tax Returns and Electronic Tax Payments
• E-Commerce Law 2000	- Internet

Source: Luis Vera Vallejo, "E-Commerce Legislation: The Mexican Experience", (Vera Abogados, S.C., July 2001)

LEGAL AND REGULATORY FRAMEWORK

Until recently, the GOM resisted efforts to address e-commerce issues, as was evident by their unwillingness to broach these topics in international fora. This reluctance may have been a product of the GOM's lack of understanding of the importance of e-commerce to economic development. In the past two years, Mexico has undertaken several new initiatives designed to promote the development of a legal, policy, and regulatory framework that would create an "e" society in Mexico, and bring it into the global digital economy.

E-Commerce Law 2000¹⁹

One of the most significant indicators of the GOM's new attitude on e-commerce was its recognition that Mexico's ability to conduct global e-commerce was being severely

hampered by the lack of a legal framework that would harmonize Mexico's standards and norms for online commercial and legal operations with those of the international community.

Therefore, on May 29, 2000, four amendments to the Civil and Commercial Codes, which are also known as the E-Commerce Law 2000, were published in the Federal Official Gazette. Entering into force on June 7, 2001, these amendments serve to apply functional equivalence to four existing laws governing the physical world, including the Federal Civil Code (CC), the Federal Civil Procedures Code (CPC), the Federal Commercial Code (CCom), and the Federal Consumer Protection Law (CPL).

The major results of these amendments are as follows:

- The CC was amended to acknowledge the validity and full legal effect to those acts and civil contracts undertaken and made through electronic means.
- The CPC was changed so that all information generated or transmitted through electronic means is now

19. Sources on the E-Commerce Law 2000 include: Baker & McKenzie, "Clients Bulletin/E-Commerce Amendments", May 2000; Luis Vera Vallejo, "E-Commerce Legislation: The Mexican Experience", (Vera Abogados, S.C.) July 2001; and U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001.

admitted as evidence in all judicial proceedings. Although prior to the E-Commerce Law electronic evidence was sometimes admissible in court, the judge was responsible for determining whether or not to accept it and how to evaluate it.²⁰ (Baker & McKenzie, Clients Bulletin/E-Commerce Amendments, May 2000). In addition, electronic transactions were given the same evidential effect and validity as if undertaken using traditional paper and ink based media.

- A new e-commerce chapter, called “Rights of consumers in electronic transactions and transactions by any other means”, was created within the CCom. This chapter establishes that electronic means can be used for commercial acts; sets out rules for determining the time at which data messages are officially sent by the originator and received by the addressee; provides acknowledgment of the legal validity of commercial contracts executed by means of a “data message”, which includes information generated, sent, received, stored, or communicated using electronic, optical or any other technology; and, allows data messages to satisfy requirements of signature in commercial law.
- The CPL was amended to cover e-commerce and the Internet (for more details see the section on consumer protection on page 64).

20. Baker & McKenzie, “Clients Bulletin/E-Commerce Amendments”, May 2000.

- The “Need of Prior Written Agreements” was eliminated.²¹

While the E-Commerce Law resolves many issues that were thought to be preventing Mexico from successfully conducting e-commerce, it also created additional requirements that most experts contend will act as a hindrance to doing business online in this market. For example, under these amendments, it is necessary to provide proof that data messages are attributable to the obligated persons, keep the messages available for ulterior reference, and guarantee the reliability of the mechanisms used for generating, storing, or sending the content. In order to meet these, and other tax-related requirements, companies must maintain original, unaltered paper documents related to a given sale or contract for 10 years after the transaction. Industry considers these requirements to be overly burdensome, and are working with the GOM to implement additional legislation designed to address these issues. See the section on the electronic invoice on page 63 for more details.

Mexican Obligatory Standard (NOM) on E-File Records Retention

In order to provide assistance to Mexican businesses and citizens in meeting the requirements of the E-Commerce Law, and to ensure the integrity and “non-alteration” of e-documents, the Ministry of Commerce (SECOFI) has issued the Mexican

21. Before passage of the Amendments, in order to enter into a contract other than in the presence of the other party, a prior written agreement had to be concluded. Ibid.

Obligatory Standard (NOM) on E-File Records Retention, which is based on the Common Criteria for Information Technology Security Evaluation (CCIMB-99-031 version 2.1) as prescribed by the International Organization for Standardization.²² The NOM on E-File Records Retention will have two main components: It sets PKI as the standard logarithm for encrypting these electronic documents, and it establishes official third party certification service providers.²³ The public comment period on this NOM ended on January 14, 2002, and as no major complaints were lodged against its standards, it is predicted to go into effect by mid-year 2002.

OTHER POLICY ISSUES

Digital Signatures

On October 6, 2000, two additional pieces of legislation or “cooperation agreements” related to digital signatures were published in the Federal Official Gazette—one sponsored by the Ministry of Commerce and Industrial Development and the other jointly sponsored by the National Association of Public Brokers and the National Association for Public Notaries. Set to enter into force sometime in May or June 2002, the purpose of these “cooperation agreements” is to establish formal mechanisms for digital certificates in the execution of commercial

transactions.²⁴

Since that time, work has been done to pull these bills together into one piece of draft legislation. Specific details on how the new system will work within the context of current operations is still unclear. Although the draft legislation says that anyone can act as a certifying authority, notaries are lobbying to be the sole organizations qualifying to be CAs. It is also undecided whether PKI will be established as the standard legal technology used for electronic signatures. Proponents of developing a system based on a particular technology feel that it will eliminate confusion and make it easier for businesses to comply with the new law. Yet, it is also argued that if an effective method of agreement already exists between parties, this should be admissible in court.

The digital signature legislation is expected to be addressed by Congress in the September session, and passed by the end of 2002.

Electronic Invoice

In Mexico, the “official invoice” or “factura” serves as the basic document for identifying and collecting Mexico’s value added tax (VAT). The requirement that hard copies of the factura used in electronic

22. Sergio Rodriguez-Castillo and Maria Alejandra Lopez-Contreras, “The Legal Challenges Facing Mexico On-Line” (Baker & McKenzie) 2000.

23. Luis Vera, “The Mexican legal Environment for the E-Society in the Private and Public Sectors: Current, Ongoing, & Future Regulatory and Policy Matters”, Vera Abogados, S.C. , 2001.

24. Baker & McKenzie, “E-Commerce Newsletter”, 2000.

FIGURE 4.3 Main Components of Mexico's Federal Consumer Protection Law

According to Mexico's consumer protection-related laws, relations between consumers and suppliers are to be subject to the following basic principles:

- Protection of the consumer's life, health and security against risks posed by products or services potentially dangerous or harmful.
- Education of consumers to improve their buying decisions in the marketplace and their position vis-a-vis suppliers.
- Access for consumers to clear and full information regarding the different products and services available in the marketplace.
- Effective prevention--and when necessary, reparation--of any injury to consumers resulting from the consumption or use of any product or service.
- Access on the part of consumers to the agencies charged with protecting and guaranteeing consumers interests.
- Assistance and support to consumers in defending their rights.
- Consumer protection against misleading and abusive advertising, coercive and unfair commercial methods and contractual clauses.

Source: The Ministry of Trade and Industrial Development (SECOFI), "Mexico's Federal Consumer Protection Law", www.secofi-ssci.gob.mx/ppc.

transactions be kept for 10 years is widely viewed as a major impediment to small and medium-sized firms' ability to conduct e-commerce due to the associated prohibitive administrative and storage costs.²⁵ The proposed Regulations for the Recognition of the Commercial Electronic Invoice for Tax Purposes that would eliminate the need for this requirement by establishing encryption standards designed to ensure the integrity of electronic invoices. However, the Ministry of the Treasury (Hacienda), which is responsible for the production of this bill, has been slow in pushing the bill towards passage. Some experts are optimistic that the e-invoice law will enter into force in May or June 2002, but it could easily be

pushed-back until a later date.

Consumer Protection

The Federal Consumer Protection Law (LFPC) and the Federal Law on Standardization and Metrology (LFMN) set consumer rights, ensure the equity and security of consumer-supplier relations, and outline the mechanisms by which mandatory and voluntary standards may be established for specific products, systems, processes, services and practices.²⁶

For more information about these particular laws, see FIGURE 4.3 below. These laws

25. U.S. Department of Commerce, "The E-Commerce and Internet Market", Industry Sector Analysis, January 2001, www.usatrade.gov.

26. Ministry of Trade and Industrial Development, Mexico, "A Quick Guide for Foreign Consumers in Mexico", September 1999; Secretaria de Economía, "Mexico's Federal Consumer Protection Law", www.secofi-ssci.gob.mx.

are administered and enforced by the Federal Public Prosecution Office Consumer Division (PROFECO), which has a mission very similar to the Federal Trade Commission in the U.S. in that they were created in 1976 as part of the LFPC to promote and protect consumer interests. For more information about PROFECO or consumer rights in Mexico, see the contact information listed in the Appendix section.

The E-Commerce Law/Amendments includes the following additions to the CPL:

- E-Commerce must comply with all provisions applicable to information and advertising of the offered goods and services
- The consumer is entitled to be fully informed on the terms, conditions, cost, additional charges, and payment terms with respect to the goods offered by online vendors
- Vendors shall ensure that proper care is taken with their online advertising practices, to protect vulnerable sectors of the population (e.g., children, the elderly and the sick), by incorporating into advertising warnings to inform them if the content is not adequate for particular segments of the population. Vendors essentially cannot publish or send out misleading advertising via the web.²⁷

The electronic commerce chapter of the CPL was inspired by the OECD's Consumer

Protection Guidelines and has been approved by the OECD's Committee on Consumer Policy.²⁸

Data Privacy

Currently, the protection of personal information in Mexico is regulated under the Federal Copyright Law and the Federal Consumers' Protection Law. The E-Commerce Law 2000 amended the CPL to include two additional provisions related to data privacy, which are:

- Providers are required to use information given to consumers in a confidential manner. In addition, providers cannot transfer the information to third parties, unless there is express consent from the consumer or a requirement from a public authority.
- Providers are required to use technical measures to provide security and confidentiality to the information submitted by the consumer. They must also notify the consumer, prior to the transaction, of any other potential uses for the information collected.²⁹

Despite these changes, consumers have continued to lodge complaints that they are not being adequately protected and contend

²⁷ Luis Vera Vallejo, "E-Commerce Legislation: The Mexican Experience", (Vera Abogados, S.C.) July 2001.

28. FTAA-Joint Government-Private Sector Committee of Experts on Electronic Commerce, "Second Report with Recommendations to Ministers", April 2001, p. 32-33.

29. Luis Vera Vallejo, "E-Commerce Legislation: The Mexican Experience", (Vera Abogados, S.C.) July 2001.

that additional laws are necessary to ensure that their personal data is kept confidential online.

In response to these concerns, a number of groups are working to develop more comprehensive privacy legislation. Two bills have been sent to the Mexican Congress—one sponsored by the Senate and the other by the Executive branch.

Currently, there is little public information on these bills, but by all accounts they are both modeled directly after the EU Data Protection and would prevent the trans-shipment of personal data to countries that lack “adequate” privacy frameworks, including the United States. In fact, one Mexican private sector representative claims that the 2nd bill introduced by the Executive branch in late-August 2001, is practically identical to the Spanish data protection legislation.³⁰

It has been reported that the Senate bill requires that all sites requesting users to provide personal data must register this request along with their reason for collecting it. It is unclear where the registration will take place or how it will impact foreign Web sites operating within Mexico. Violators of this requirement, including those who fail to register or who use data for other than stated purposes, could face jail time.

Mexican industry views these bills with concern, believing that they should be revised to reflect a better balance between citizens’ right to privacy and the needs of

industry to establish their own business processes. Since there seems to be no option to simply eliminate the bills, industry hopes that they will be able to at least amend them to be less burdensome. They are very worried that the legislations’ stringent requirements will only serve to further inhibit e-commerce from taking off in Mexico.

Apparently, industry has some support within the GOM. The Ministry of Economy argues that the registration system, as outlined in the Senate bill, would be difficult to maintain and even more onerous to enforce. As a result, they would prefer to see a scaled-back law, which would, at the very least, eliminate criminal sanctions. In addition, the Electronic Commerce Commission, which is a public-private committee that advises the Mexican Congress on e-commerce issues, also thinks that a moderate approach to data privacy would be more effective for the development of e-commerce in Mexico. A new draft bill—sponsored by a private sector group—is also beginning to be circulated to GOM decision-makers. It reportedly reflects a more balanced approach to this issue.

It is unknown when the various drafts of the privacy legislation will be reconciled or when one will eventually be addressed and/or passed by Congress. Some experts have suggested the end of 2002 as a reasonable estimate of when it will be passed, but that may be optimistic considering the ongoing debate about what

30. Interview with Representatives from the Asociacion Mexicana de la Industria de Tecnologias de la Informacion (AMITI), September 200.

the privacy legislation should contain in final form.³¹

Cybercrime

On May 19, 1999 an amendment to the Criminal Code was passed, making hacking (or accessing, amending, destroying or causing the loss of information contained in protected computer systems and equipment without prior authorization) a crime.

Sanctions, as laid out in the amendment, are increased if such violations are committed against the government or banks, or if the information obtained is used for one's benefit or the benefit of a third party.

Although this amendment reflects real progress in addressing hacking, which can be extremely damaging, the GOM has not addressed a number of other key forms of online crime, including:

- Fraud by electronic means or the gaining of unfair advantages by deceiving or causing damage to another individual;
- Interception of information or fraudulent interference, impediment or intrusion of communications, the substitution of other communications instead of the original ones, and public disclosure of the same;
- Plagiarism, as in alterations to messages sent or received for one's own benefit, causing damage to

another person;

- On-line child pornography;
- Spydering, or the gathering of information from other sites without authorization;
- Regulation of access by minors to certain sites, as well as the information that is sent and requested of them;
- Regulation of the sale of pharmaceuticals (especially prescription-controlled drugs) through the Internet;
- Espionage, or obtaining access codes and other confidential information through hacking.³²

While the above would all be considered crimes in the off-line world in Mexico, they are not in the online world. Mexico's criminal law is strictly applied and cannot consider particular conduct a crime unless specified exactly. Accordingly, it is necessary for the GOM to review the criminal code to determine which laws need to be changed to accommodate the prosecution of crimes that are committed via electronic means.

A bill, that was reportedly written and introduced to the legislature by a private association, attempts to address some of these issues, and also puts legal restrictions on harmful content. Not many details are

31. Interview with Jesús Orta, General Director of Commercial Modernization of E-Commerce and IT, September 2001.

32. Economist Intelligence Unit, "Mexico Regulations: Fox Plans Oversight of Internet Policy. Country Briefing", December 14, 2000.

known about this bill, but the Ministry of Economy official interviewed for this report felt strongly that the content limitations introduced would be too restrictive and would limit the ability of Mexican citizens to fully utilize the Internet.³³

Intellectual Property Rights

Piracy continues to be a significant problem in Mexico, effecting the ability of content producers to fully engage in online endeavors. Currently, Mexico is working on strengthening intellectual property rights in two ways.

First, industry is urging the GOM to reinforce and update the Copyright Act and to improve protection of copyrighted materials. In addition, Mexico recently signed the both World Intellectual Property Organization's (WIPO) "Internet Treaties"—the Copyright Treaty (which went into effect on March 6, 2002) and the Performances and Phonograms Treaty (which will go into effect on May 20, 2002).³⁴

Second, industry is interested in the GOM starting a review of the Industrial Property Law and/or enacting a federal law regarding domain names protection.³⁵ Although cybersquatting has not yet been a problem in Mexico, the Dispute Resolution Policy of

the Network Information Center (NIC) in Mexico is expected to soon issue a new policy that will implement ICANN's Uniform Dispute Resolution Policy and will be administered by WIPO.³⁶

Other Potential Legislation on E-Commerce-Related Issues

While the following bills have not been circulated, they address issues that are of serious concern for Mexican and foreign companies operating in Mexico:

- There is a proposal to amend the federal television act to classify the Internet as broadcasting. Under this new system, Internet Service Providers (ISPs) would be subject to broadcasting restrictions and would be required to get a concession to operate. This system would be supervised by the Ministries of the Interior and Communications.
- An amendment has been proposed to the Copyright Act to require additional tariffs on anything that could hold copyrightable materials, including computers, CD-ROMs, etc. If this amendment were passed, it would have a disastrous impact on Mexico's ability to become a digital society. Inexpensive, yet relatively

33. Interview with Jesús Orta, General Director of Commercial Modernization of E-Commerce and IT, September 2001.

34. Economist Intelligence Unit, "Mexico Regulations: Fox Plans Oversight of Internet Policy. Country Briefing", December 14, 2000.

35. Interview with Representatives from the Asociacion Mexicana de la Industria de Tecnologias de la Informacion (AMITI), September 2001.

36. Economist Intelligence Unit, "Mexico Regulations: Fox Plans Oversight of Internet Policy. Country Briefing", December 14, 2000.

new technologies are necessary to accomplish the goals set out in E-Mexico.³⁷

E-Government

One of the main goals of E-Mexico is to create a federal digital government in Mexico that will serve as a model for IT development for local governments, as well as the Mexican private sector. Part of this effort will include procurement of IT equipment and services, including computers, administrative applications, networking devices, and video conferencing equipment.

In addition, training to familiarize GOM employees with the new equipment will also be necessary. In fact, E-Mexico promises the establishment of a comprehensive inter-governmental training program that will cover everything from how to use a computer to how to troubleshoot a network.

Both of these aspects of Mexico's e-government plans hold promise for U.S. companies, as suppliers will be needed to provide the overwhelming amount of products outlined in E-Mexico. Again, it is unclear when the funds will be appropriated. See CHAPTER 4: MARKET OPPORTUNITIES AND MARKET ENTRY STRATEGIES for more information.

MULTILATERAL, REGIONAL & BILATERAL COOPERATION

Mexico is a member of most of the key multilateral and regional trade organizations, including the FTAA (1995), OECD (1994), APEC (1993), and WTO (1995). While the GOM is beginning to play a larger role in some of these groups--as Chair of APEC in 2002 for example--it has remained relatively quiet in terms of specific contributions on e-commerce in these fora. However, the GOM indicated recently that it plans to increase its level of commitment in the e-commerce groups of which it is a member. In APEC, one of their top priorities is cooperation, specifically on new economy issues. Also, in the FTAA Joint Committee on e-commerce, Mexico's participation has reflected its more open attitude towards sharing information on e-commerce related topics, such as consumer protection, digital divide, and e-government.

The principal bilateral engagement on e-commerce between the U.S. and Mexico is through the U.S.-Mexico Bilateral Cooperation Agreement. Signed in September 1999, this agreement was concluded with the purpose of using information technologies, including the Internet, to promote e-commerce and bilateral trade via the Internet.

Events that have taken place since the initiative began include a video conference between Government officials on Mexican authentication legislation and a visitors program where the Department of Commerce worked with the U.S.-Mexico Chamber of Commerce to host a delegation of 22 Mexican e-commerce policy makers meetings and seminars on e-commerce policy.

37. Luis Vera, "The Mexican legal Environment for the E-Society in the Private and Public Sectors: Current, Ongoing, & Future Regulatory and Policy Matters", Vera Abogados, S.C., 2001.

In addition, four representatives from Mexican industry participated in the inaugural session of the Inter-American E-Business Fellowship Program—a program run by the U.S. Department of Commerce and designed to train Latin American mid-level business and IT managers in how to improve their businesses through the use of IT solutions. For more information on this program, go to:

www.export.gov/ebusinessfellowship.

CHAPTER 5: MARKET OPPORTUNITIES AND MARKET ENTRY STRATEGIES

MARKET OPPORTUNITIES

Mexico offers U.S. telecommunications, IT and e-commerce companies excellent business opportunities as the market continues to grow and mature. U.S. technology and products in these sectors are popular in Mexico, and NAFTA makes the purchase of U.S. products and services more favorable due to the reduction or elimination of duties on most IT and telecommunications products. The telecommunications and IT technologies in demand in Mexico are similar to those in demand in the United States. However, market intricacies and differences in Internet and e-commerce adoption trends mean that some U.S. technologies may not succeed, must be modified for the local market, or that less expensive or less cutting-edge technologies may be more appropriate. Market entry strategies must also be adapted to the Mexican market.

Opportunities in Telecommunications

Increased competition and pent-up demand for new technologies create huge market opportunities for U.S. telecommunications equipment suppliers and service providers.

Telmex will continue to dominate the fixed-line market, but new entrants are making inroads and all wireline operators will be improving and expanding their networks with expediency in the coming years. Both the incumbent Telmex and new entrants must invest in the latest technologies to quickly improve the quality, speed,

geographic reach, and capacity of their networks. As transmission of data becomes increasingly crucial to the corporate sector, the fixed-line segment with greatest room for growth in the next five years will likely be that of data communications. This should increase demand for bundled packages of services and spur investment in end-to-end technologies that enhance the competitiveness of new entrants' offerings. Additionally, demand for telecom equipment is sure to increase over the next five years, as both residential and corporate clients drive telecom operators to upgrade their networks in order to take advantage of higher-speed technologies that maximize the potential of the Internet.

The Mexican market for wireless services offers significant opportunities for American firms, since it is comparatively faster, more cost-effective, and requires less paperwork to build out wireless infrastructure. In 2000, the number of cellular lines surpassed the number of fixed-lines installed and this gap will continue to widen. Industry analysts estimate that more than one million wireless lines will be installed over the next two years. As Mexican consumers develop an appetite for new technologies, opportunities will abound for 2.5G and 3G products. Implementation of the "calling party pays" regime is another major factor driving the growth of cellular use in Mexico. This billing system became available in 1999 and the number of cellular lines in Mexico doubled soon thereafter. One of the most potent drivers of wireless growth in Mexico has been the prepaid market, structured to

make wireless use affordable to customers in lower economic strata. The prepaid system appeals to market segments that do not qualify for or do not wish to maintain an open-ended or monthly service contract. Nearly 90 percent of Mexico's wireless subscribers currently use prepaid plans and more than 95 percent of new subscribers are selecting the prepaid approach. The number of prepaid subscribers is projected to reach approximately 40.3 million in 2005.

The Mexican landscape for foreign direct investment is somewhat restrictive, placing a 49 percent cap on foreign ownership. The exception to this restriction is cellular services, which allow for greater than 49 percent foreign investment with prior approval from the National Commission on Foreign Investment (CIE). All requests to own even parts of Mexican companies must be approved by the CIE.

Many industry specialists believe that the most effective strategy for U.S. small- and medium-sized enterprises (SMEs) to penetrate Mexico is through subcontracting or partnering with the larger equipment vendors and systems integrators that are already active in the market. As in other markets, SMEs whose telecom equipment competes directly with the larger vendors' products may have difficulty establishing a foothold in Mexico on their own. On the other hand, SMEs with niche products that do well in the U.S. market should be able to sell products directly into Mexico. As telecommunications networks continue to expand and become more sophisticated and new operators enter the Mexican market, the demand for technical software such as packages to administer telecommunications switches will rise. Software applications for mobile voice and data communications

represent large growth areas, as well.

Additional opportunities exist in the area of value-added services (VAS) such as billing systems implementation, particularly as both the incumbent and new entrants will need to offer various discounts and creative billing regimes to attract customers and add Internet-related services to their portfolio offerings. There is also a demand for call center services, as many telecommunications operators are establishing such centers to improve their customer service.

Opportunities in Information Technology

As firms in Mexico increase spending on IT, demand rises for many leading-edge technologies supplied by U.S. firms. Although the economic downturn has hindered IT spending in general, companies are focusing on technologies that give them more value for their money. For instance, although many Mexican firms are not currently upgrading their computer systems, they are using more servers, and thus networking equipment, to save money on separate Internet connections, software licensing and other costs involved in stand alone systems.

Although Mexican firms would like to invest in many information technologies and services, their IT budgets have been squeezed by the recent economic downturn. As a result, many firms are hesitant to commit to IT investment outlays if they are not sure of the benefits, particularly in terms of cost. These companies will benefit from information regarding the economic advantages of investing in the latest technologies and how to prioritize their investment options.

Medium-sized businesses offer the best opportunity for sales of IT products in Mexico. Those companies that can afford it are investing in enterprise resources planning and customer management software and intranets in order to integrate front and back offices. Many of these companies turn to U.S. suppliers and consultants for their expertise. As Mexican firms open their corporate networks to the outside through the development of extranets, and engage in e-commerce, demand for network security products and services will grow.

Finally, there is a specific need for IT solutions for small communities with a low fixed-line potential, as Telmex reportedly will not put lines anywhere there is less than a potential for 2,000 lines. U.S. companies with creative solutions to the IT needs of these communities offer a wide variety of opportunities for sales of U.S. IT products.

Computer Hardware and Networking Equipment

Sales of servers and networking equipment, such as routing and switching equipment, are increasing, creating excellent opportunities for sales in the following areas.

IT services

During economic downturns, companies tend to reduce their investment in hardware and increase their use of services, especially maintenance services. All types of computer hardware and peripheral maintenance services are needed.

Software and Related Services

Web-based applications represent a big opportunity for U.S. software suppliers. Many small and medium-sized (SMEs) Mexican firms are using application service providers (ASPs) as a way to save money. For a monthly fee, these firms have access to software and infrastructure they do not have the means to purchase, and technological expertise which they may not have in-house. Many ASPs are providing web-based applications to customers, saving the customers from having to pay for multiple licenses and constant upgrades. Many SMEs do not have the money to invest in the necessary infrastructure and software to accomplish their goals all at one time (see MARKET ENTRY STRATEGIES for more information on creative sales financing). The use of ASPs is popular and growing.

Demand for SME-Targeted Software

Until companies can see real advantages to upgrading their systems, software programs that work in conjunction with Microsoft Office 1995 will be easier to sell. Mexican companies reportedly have “islands” of information, but there is no interaction among databases.

Growing Popularity of Supply Chain Management Software

Demand is strong especially for supply chain management applications that address procurement and transportation issues, such as coordination with suppliers, distributors, and customs brokers. Applications with ease-of-use features currently in demand in the United States will also do well in Mexico.

Software and Services that Integrate Business Processes

New convergence services are needed. Most Mexican companies cannot link their back office to a transaction on the Web and many do not know what their inventory is at the time of a sale. Companies that can link different companies Web sites are also needed. Finally, systems integrators to install programs are in demand.

Opportunities for Internet & E-commerce Solutions

In the Internet and e-commerce realms, successful foreign firms will be those that can tailor their technologies and offerings and apply innovative solutions to deal with the barriers present in Mexico's on-line market.

Mexico's low PC penetration and teledensity rates indicate that Internet access via other means will likely be more common than in the United States, implying a demand for mobile data services, cable television, WLL, LMDS, MMDS, and other Internet access technologies. Low credit card usage in Mexico is also creating opportunities for e-commerce applications and on-line financial transaction services that do not require credit cards. This situation is spurring financial institutions to demand and invest in alternative technologies for facilitating e-commerce, such as technologies to allow Web-based vendors to debit on-line shoppers' bank accounts. For example, Mexicans are accustomed to using smart cards for both public and cellular phones; these cards could also be used to facilitate e-commerce payments. Finally, the country's poor delivery infrastructure means that on-line

shops may need to partner with traditional "brick and mortar" retail outlets to fulfill orders and function as pick-up sites, creating demand for technologies to facilitate these relationships.

An increasing number of Mexican firms are eager to implement Internet and e-commerce strategies. Some local solutions are available for B2C or B2B e-commerce markets. However, most critical solutions, such as e-procurement and e-sales technologies, come from the United States. U.S. Internet and e-commerce products and services usually enter these markets as part of larger business solutions offered and implemented by consultants. Therefore, excellent opportunities for U.S. firms exist in the following areas:

- Small U.S. consultants, experienced in specific information technologies, that understand how to develop and implement IT strategies. Large consultants are often too expensive for many local firms, particularly for smaller companies, while local consultants reportedly do not have enough industry expertise.
- Web developers and Web hosting services.
- Web hosting in the United States for Mexican companies--in some cases this is a cheaper alternative for Mexican companies. For example, Web-hosting for one Mexican organization costs \$500 a month in the United States as compared to \$7,500 in Mexico.
- E-commerce solutions of all types are in demand.

- Search engines.
- Good demand for GPRS applications for chat/Internet relay chat, delivery of textual and visual information via mobile phones and computers, (e.g., Web browsing, document sharing, job dispatch applications, corporate and Internet e-mail).
- Chat/Internet Relay Chat (IRC) are good prospects for investment.
- ISP-related services provide good investment opportunities.
- Content providers.
- A wireless network must be built in order for E-Mexico to work. U.S. companies involved in building wireless Internet infrastructure, or other forms of mobile access, and in providing complimentary services would do well. Companies selling hardware that provides mobile access, such as Palm, APAC pocket PC, Handspring or the HP Jornada will also do well in the near future.
- Network security/technology offers excellent opportunities for U.S. firms as there are no local companies. Encryption and network protection are in great demand.

Opportunities in E-Commerce

U.S. e-commerce companies are well-positioned to do business in Mexico. In 2000, 70 percent of online purchases made in Mexico were from U.S. suppliers. This is attributable to a number of factors, including

Mexican consumer concerns with security on Mexican Web sites and the small number of Web sites selling goods online in Mexico.

Companies that sell small and low-cost consumer items, such as books or CDs, will have the most luck in the B2C market in Mexico, reflecting the low purchasing power of the average consumer and the youth of the average Mexico Internet user. In addition, Web sites that are in Spanish and have localized content reflecting differences in the Mexican system will be able to reach a greater number of users. Since B2B is much more established in Mexico, companies looking to supply Mexican businesses will have the most success in this market.

MARKET ENTRY STRATEGIES

If a U.S. firm plans to sell telecommunications or IT (including e-commerce-enabling technologies and software) products in Mexico, the choice of where to begin will depend on the demand for its technologies and service offerings. Business and marketing styles differ between the U.S. and Mexican markets. As always, careful research, thorough planning, and detailed strategies will pay dividends.

Localization is Critical

A major factor for success in Mexico is the localization of products and services. Localization for language is particularly important. Companies should keep in mind that there are differences in the Spanish language, and even more in cultural background, among the various Spanish-speaking countries of Latin America and Spain. Therefore, a firm should not assume that Spanish language programs or content

developed for one market will be successful in any other Spanish-speaking market. Industry experts in Mexico strongly advised that all such content and programs should be localized for the Mexican market, and that U.S. companies go to Mexico to localize content.

Language localization is critical for Internet and e-commerce Web sites. Research indicates that Web users are three times more likely to make a purchase over the Internet if the site is in their native language. However, for Web sites, particularly those used for e-commerce, language issues can have many hidden costs. Native-language staff are necessary to maintain the sites, answer customers' questions, and fulfill orders generated electronically. In contrast, language localization is not as imperative for software programs that perform back-office and technical functions. Industry observers also state that users of niche software products are often eager to obtain new software programs quickly and prefer not to wait for translations.

Localization to account for cultural differences is equally important. Localizing Web sites in terms of "look and feel" is critical. Web applications and content catering to local customs and culture will be well-received. As a result, hiring Mexicans who have a native understanding of the country's culture to localize the offering is the best strategy.

Finally, a U.S. firm should confirm that its technologies are compatible with local technologies or habits. Some technologies simply may not be used in the Mexican market. For instance, although coin-operated pay phones are used in Mexico, many Mexicans use pay phones based on

smart cards. As a result, technologies for coin-operated pay phones may not be in as high demand in some areas of Mexico. Conversely, phones based on smart cards may not exist outside of major metropolitan areas.

Local Representation is Key

IT industry experts interviewed in Mexico stress that for smaller U.S. firms, some form of local representation is essential. Business in the country is very relationship-oriented and "face-to-face" interactions are much more important in Mexico than in the United States. A local partner will give a U.S. firm a local "face" and will use personal ties to locate and approach new customers more effectively. Local representation will give small U.S. firms more credibility, help U.S. SMEs overcome a lack of brand recognition, and make potential customers more comfortable as well. Working through a local firm also offers easier access to knowledge of the local market, such as sales cycles, economic issues, regulatory issues, and cultural factors and tastes. According to industry observers, there reportedly is a wariness in Mexico of foreign firms that want to sell a product or service without a local presence. A local presence shows customers that they will not need to call the United States if they have problems or need technical or customer support. However, industry experts interviewed recommend that help desks (for computers, software etc.) be located in the United States rather than in Mexico, as there is insufficient trained Mexican talent at this time to be able to offer local service.

But Which Form of Local Representation?

An excellent option for U.S. firms is to set

up a local office and hire local employees to do marketing, training, and provide on-going support for the company's technologies. Small companies wanting to establish operations in Mexico will need to have external financing options unless their cost recovery system allows for growth¹. However, for small firms just entering the market, there are lower cost options with which to begin. One option is to partner with a large, established IT firm, systems integrator, or consultants already active in Mexico. Another is to partner with a like-minded Mexican IT SME with complementary skills and technologies. Other options would include agents, distributors, or other representatives who can represent the U.S. firm and support its customers. Local industry experts stress that prior to choosing a local presence strategy, such as partner or representative, it is important for the U.S. firm to visit the target market and try to understand "first-hand" the local market and business culture.

Partnering with Telecommunication Service Providers

Telecommunication companies are strong competitors of IT companies in Mexico because they own the infrastructure. Therefore, industry experts in Mexico recommend that telecommunication firms should be the primary source of business partners for U.S. ISPs. Industry experts also recommend that IT companies approach telcos as a channel for their products or services. For example, as mentioned in CHAPTER 2, Telmex sells computers

through its ISP, Prodigy. These experts recommend that U.S. companies approach Telmex first, as the company has been known to make things difficult for foreign companies that approached other telcos first or attempt to set up on their own without approaching Telmex beforehand.

Partnering with Large, Established IT Firms, Systems Integrators, or Consultants

Small companies in the international marketplace often lack the brand recognition and delivery channels enjoyed by larger companies. Working with more established, larger foreign IT and telecommunications firms, systems integrators, or consultants already doing business in Mexico can help a U.S. firm with its initial expansion into the country. These firms integrate the U.S. technologies into their product or service suites, allowing the SME to reach customers they might not otherwise know about and help build name recognition. According to Mexican industry representatives, many IT firms, systems integrators, and consultants working in the country are constantly looking for new leading-edge technologies from small U.S. firms (see below).

Or Partnering with Like-Minded Mexican SMEs

Mexican IT SMEs are eager for U.S. partners, and U.S. companies may want to consider collaborating with small local firms with complementary products or services. Many IT experts interviewed in Mexico recommended strategic alliances or partnerships as an effective way for U.S. IT SMEs to penetrate the Mexican market. Depending on the culture and organizational goals of each company, an alliance could be very formal, with well-established

¹ A sizable volume of Mexican, and Latin American high technology business is conducted in Miami. Venture capital can be secured there for companies wanting to enter these markets.

responsibilities, or less formal, depending on each company's corporate culture and goals. Mexican IT firms seek partnerships with U.S. firms for various reasons, including access to: 1) technologies necessary to execute ideas; 2) trained and knowledgeable people; 3) training; and 4) perhaps most importantly, additional financial resources.

Mexican IT firms want to partner to gain access to U.S. firms' leading-edge technologies. According to local industry observers, most Mexican start-ups have ideas but lack the hardware, software, and technical knowledge to create the intended solution. Mexican SMEs also seek U.S. expertise, particularly with Internet and e-commerce technology implementation. In particular, small local systems integrators and consultants desire to partner with similar U.S. firms to provide services such as systems integration, and Internet and e-commerce strategy consulting. Mexican start-ups know that being first-to-market with the latest technologies is critical, and that the IT industry's rapid pace of technological development and short product life cycles require partnering to obtain these technologies and expertise, instead of trying to develop them "in-house." Further, because U.S. firms have the reputation of being at the forefront of these technologies, partnering with U.S. IT SMEs provides Mexican IT firms with technological legitimacy.

U.S. partners are desirable for their human resources as well. Because the Internet is so new in the country, few people are familiar with IT technologies or have relevant experience. Firms in the industry report that finding talented management and quality staff at the necessary pace is a factor

limiting the growth of local firms.

Therefore, Mexican companies are willing to pay well for good quality training in the necessary technologies, such as Web site design and maintenance, or systems integration, or other training necessary for the partnership to succeed. In addition, companies may also be more favorably inclined to purchase equipment and services from their partners if training is included.

In addition to technology, Mexican start-ups also hope to obtain capital via partnerships. Despite the existence of some venture capital, most new IT firms in the region continue to lack funding. Interest rates on bank loans are prohibitively high in Mexico, and Mexican banks tend to be especially wary of lending to unproven start-ups or even to small IT firms with an established business. IPOs are rare. Thus, IT industry representatives in Mexico state that it is especially useful for their local Internet and e-commerce companies if potential partners can bring to the partnership much-needed financing.²

Using Agents or Distributors

Agents and distributors, another possible approach to local representation, can offer cost-effective entry into new markets for U.S. IT firms. Like other partners, they can assist the U.S. firm with their knowledge of the intricacies of the target market, such as regulations and taxes.

Agents and distributors differ slightly. Agents generally take orders for and sell a product or service, but do not take possession of a product and are not directly

2. Preferably at U.S., not local, interest rates.

responsible for payment. In most countries, an agent has more than one client and therefore may sell products or services which compete with those of the U.S. producer. A distributor is typically responsible for the payment of a product that is exported. Distributors sometimes combine their own product with that of the U.S. exporter, which makes the distributor more committed to selling the exporter's product.

Local market experts state that small U.S. firms, which provide services such as e-commerce planning or enabling, who do not choose to partner with a similar small IT firm will need an agent to sell their services locally. They also suggest that using local software distributors, who sell to systems integrators or directly to end customers, is a good avenue for U.S. software firms.

Lists of agents and distributors can be found at the end of Industry Sector Analysis reports published regularly by U.S. Department of Commerce market specialists in Mexico.³ Market specialists state, however, that lists change often because the industry changes quickly. A second way to find agents or distributors is to search advertisements in specialized magazines in the target country, similar to industry journals in the United States. Another way to locate agents or distributors, advocated by one industry expert, would be to determine which agents or distributors are used by the major players in the same market or general industry segment, and attempt to use the same ones. The U.S. Department of Commerce also provides an

Agent/Distributor Service that will locate and qualify potential candidates in target markets.⁴ Regardless of how agents or distributors are found, it is important that they be qualified in order to ensure they understand the U.S. firm's product and can provide after-sales service, if necessary.

For SMEs with highly sophisticated technologies, agents and distributors may not be the best market entry option. After-sales service, which sometimes includes working closely with the customer on technology issues, is critical in the IT industry and is a function likely best handled by the exporting firm or partner.

Consider Collaborating with Other U.S. SMEs

A unique, lower cost way for small U.S. IT firms to achieve a local presence would be for U.S. firms with complementary technologies to pool their resources to form a single commercial organization to represent them in the target market. Firms could jointly open an office, share sales people, engineers, and other resources as well. This option would be less costly and allow small U.S. firms to offer a range of complementary solutions to the target market, thus broadening their appeal.

Important Issues to Consider When Entering Mexico

Be Patient - Industry observers state that it may take longer to conduct business transactions in Mexico than in the United States. Mexicans tend to take more time

3. Industry Sector Analysis reports are described in Chapter 5.

4. The Agent/Distributor Service is described in Chapter 5.

than Americans when making major decisions and, local experts note, this is particularly true when purchasing services.

U.S. firms also must be patient when developing business relationships, such as seeking a partner. In addition, several local industry representatives stated that, because the Internet and e-commerce are so new in Mexico, finding viable partners that also specialize in these industry segments may be difficult. Thus, more time is needed for the U.S. firm to find local firms with complementary technologies or expertise.

And Price Appropriately - According to local industry representatives, a common mistake apparently has been that U.S. firms price goods and services too high for the local economy. U.S. firms must remain cognizant of budget constraints resulting from Mexico's sluggish economy. Those firms pricing their technologies for the local market likely will be the most successful.

Pricing considerations must be kept in mind for local partners as well. Some U.S. firms reportedly charge their Mexican partners U.S. prices for items such as demonstration software to show potential clients. Mexican firms state that it would be helpful to modify pricing schemes according to the local market, such as to require lower payments initially and then increase payments to recoup costs as the market develops.

Be Creative with Financing Options for Sales - Only 16 million people use the Mexican banking system. Therefore, companies wanting to sell a product or service must be willing to provide some sort of financing plan or credit. The delinquency rate is very low for privately offered credit as compared to a high rate of delinquency

with the banking system. Credit card fraud is extremely high, so this is not a recommended method of payment from most sources.

According to Mexican IT experts, it is easier to rent office equipment and software than to sell it. Most companies do not have the money or access to financing to pay for all their IT needs in one shot. Therefore, renting software often helps sell it and "subscriptions" are also a good way to get people to purchase items.

Make Sure You Are Well-Versed in Mexican Customs Procedures - Using a Mexican customs broker can help educate a U.S. firm that is new-to-market, and is especially recommended for direct sales. U.S. firms which have Mexican representation may choose to have their partners handle importations. Getting knowledgeable assistance with export documentation can help avoid pitfalls and end up saving time and money in the long run. For example, Mexico has "minimum estimated prices" (MEP) for certain goods that they believe are subject to fraudulent customs valuation. Importers of these goods must post a "guarantee" (usually in the form of a cash deposit or line of credit) in case the declared value and the MEP of the imported goods are different. The requisite cash deposit or line of credit can be established with an authorized bank (Bancomer, Banamex, or Bital) in Mexico. There are high fees for setting up, managing and closing such accounts. If a U.S. exporter's product is on the list of goods subject to the MEP, posting the guarantee can provide U.S. companies with more assurance that their products will not be delayed in customs. A U.S. exporter can use an importer's bank account or use an import

broker which will reduce the cost of exporting. (For more information on exporting to Mexico, see the International Trade section of the Overview of the Mexican Telecommunications, Information Technology and E-Commerce Markets.)

Remember that Mexican Law is Based on the Napoleonic Code - U.S. law is based on English common law which is very different from the Napoleonic Code. Therefore, it is recommended that firms looking to invest in Mexico hire a Mexican lawyer, or a U.S. lawyer trained in Mexican law, to review all legal documents. Mexican counsel can also give invaluable advice to U.S. companies on the various types of business incorporation and their tax implications for U.S. firms.

Steps to follow - U.S. firms should keep in mind the following steps in forming a strategic alliance:

- *Identify a key individual* in each company, preferably a principle owner or senior manager, who can focus on the alliance.
- *Conduct due diligence.* Check the background of the potential partner, including the quality of products and technology, business structure, and financial soundness (the U.S. Department of Commerce's U.S. and Foreign Commercial Service offices overseas have services to help U.S. companies locate such information - see CHAPTER 5).
- *Set clear objectives.* Since companies will have different objectives in forming an alliance, both parties should agree on a common set of strategic objectives to gain from the alliance at the beginning.

- *Use legal and contractual mechanisms* to protect your intellectual property rights and business interests.

Locating the Appropriate Partner or Representative

Firms must do careful research to find the best type of local representation in foreign markets. A variety of organizations exist that are eager to help U.S. telecommunications and IT SMEs find partners or representatives in Mexico. The U.S. Department of Commerce market specialists, local trade associations, and local government offices can provide needed assistance in bringing potential partners together or in screening potential agents or distributors. Trade fairs are another avenue to seek partners or representatives, although this is a less targeted approach unless meetings are pre-arranged.

The U.S. Department of Commerce Can Help

U.S. Department of Commerce telecommunications, IT and e-commerce market specialists located in district offices throughout the United States and in target markets perform various matchmaking services for U.S. firms, such as the Gold Key Service. These services are summarized in Chapter 6 of this report.

Local Trade Associations and Government Offices

Mexico has a number of IT and telecommunications-related trade associations which aim to encourage profitable business practices of their member firms, many of which are SMEs. In

addition, many local government offices which work with local firms of all industries, have offices that focus on the telecommunications and IT industries, and deal with all types of e-commerce applications (including e-government, e-education and e-procurement). Both types of organizations perform a variety of services for local telecommunications and IT SMEs, such as helping them find financial assistance and providing business plan guidance and business counseling. These organizations often take steps to assist in forming partnerships between foreign companies and local firms or to attract foreign companies to invest locally.

Trade associations and local government offices in Mexico have various matchmaking capabilities and are eager to alert their local companies about potential U.S. partners. They can help set up meetings between firms -- for example, when a U.S. firm plans to come to the target country, when a local firm plans to travel to the United States, or when firms could meet in tandem with a major trade show. Local trade associations that may be helpful will be listed in the market research reports generated by the U.S. Department of Commerce representatives based in Mexico. These types of trade associations and state-level organizations also exist in the United States and provide similar services for U.S. companies. Contact information for many of these organizations is listed in the Appendices of this report.

Trade Fairs and Trade Missions

Trade fairs in Mexico are an excellent way for U.S. SMEs to learn about the Mexican market and to introduce their technologies to them. For example, one of the most

important IT-related trade shows in Mexico each year is COMDEX Mexico, held in May in Mexico City. In addition, more focused trade fairs also exist that may be more appropriate for smaller firms. Trade fairs that focus on specific vertical industries are an excellent avenue for SMEs which have niche or vertical industry-specific products or services.

U.S. Department of Commerce personnel participate in many foreign trade fairs with, or on behalf of, U.S. firms, offering companies market exposure at prices far below regular trade fair participation costs. Trade missions and matchmakers are managed by international trade specialists in the Department. These trade events can be an excellent avenue for SMEs to gain knowledge of a foreign market, including making valuable business contacts, in a very short period of time. For a partial list of telecommunications, IT, and e-commerce-related trade fairs in Mexico and elsewhere supported by the U.S. Department of Commerce's US&FCS, see the US&FCS Web site (www.usatrade.gov). The U.S. Department of Commerce's Office of Information Technologies Web site (<http://exportIT.ita.doc.gov>) lists IT-related trade fairs, and the Office of Telecommunications Technologies' Web site (<http://telecom.ita.doc.gov>) lists telecommunications-related trade fairs. Some upcoming IT- and telecommunications-related trade events in Mexico are listed in the Appendix at the end of this report.

INTERNET SALES: AN OPTION?

The emergence of the Internet will significantly change distribution channels and customer relationships in Mexico, as it

is doing in the United States. However, Internet-based sales to Mexico can be problematic for U.S. firms.

Internet sales to Mexico from the United States can be challenging for both seller and customer. Mexico has its own distribution laws, and U.S. producers who ship orders from the United States or from third countries must take care not to violate applicable laws. Further, customers will need to pay import duties or taxes on any imported items, which a Web site should make clear prior to purchase. Industry observers report that, in some cases, customers must travel to international airports to clear their purchases through customs, which is time-consuming. Mexico's existing distribution services may make it difficult for items ordered over the Internet to be delivered in a timely fashion.

In addition, IT and telecommunications products must be localized to some degree to succeed in the Mexican market. Even if a U.S. firm can fulfill an order over the Internet, it may need to modify the product before sending it to the customer. Any products exported from the United States, including orders fulfilled over the Internet, must meet the relevant Mexican technical standards. Further, certain high-tech products must meet U.S. export control regulations.

SMEs, who often cut costs by using electronic software distribution (ESD), should be aware that Mexico's low Internet penetration rate, very limited deployment of broadband technologies, and high costs associated with Internet use mean that ESD in Mexico currently is not an option for the average software user.

CONSIDER THE BIG PICTURE

Offer input into trade policy formulation

Foreign governmental trade and regulatory policies affect business opportunities, so the U.S. government works to create effective trade policies to facilitate U.S. firms' international business efforts. Many U.S. firms of all sizes work closely with U.S. government officials to formulate trade policies vis-a-vis U.S. trading partners, including Mexico. U.S. government officials solicit and welcome input from U.S. industry on issues such as trade agreements and trade barriers that affect the ability of U.S. companies to conduct business in foreign markets.

Mechanisms for involvement in trade policy exist through the U.S. Department of Commerce's International Trade Administration (ITA) offices. Input can be informal, such as a call or e-mail to a trade specialist, or more structured, such as joining industry sector advisory committees (ISACs). Information on ITA trade policy activities is included in Chapter 6.

SUGGESTED MARKET ENTRY AND DEVELOPMENT STEPS FOR SMALL U.S. FIRMS:

- Visit Mexico to explore the local markets.
- Begin by using a distributor, one with enough geographic reach to cover at least Mexico's main economic areas.
- If sales go well, hire a local employee or partner who is a local systems integrator.
- Bring the local employee(s) to the United States for training and to

teach them your corporate culture.
This may be necessary to do on a fairly regular basis.

- If sales continue to go well, open a small local office to establish a local address.

CHAPTER 6: THE ROLE OF THE U.S. DEPARTMENT OF COMMERCE

INTERNATIONAL TRADE ADMINISTRATION

The mission of the U.S. Department of Commerce's International Trade Administration (ITA) is "to create economic opportunity for U.S. workers and firms by promoting international trade, opening foreign markets, ensuring compliance with trade laws and agreements, and supporting U.S. commercial interests at home and abroad."⁵ The Trade Development (TD) and the U.S. Commercial Service (US&FCS) divisions of ITA are responsible for export promotion. For more information on ITA, visit <http://www.trade.gov>.⁶ For more information on how the U.S. Government assists U.S. businesses export, visit <http://www.export.gov>.⁷

1. Taken from "ITA Strategic Plan, Fiscal Years 2002-2006," available at <http://www.trade.gov/ooms/ITAMeasures/ITAstrategicPlan.pdf>.

2. To access updated ITA Work Reference Charts, visit http://www.ita.doc.gov/ita_home/itawrc.htm.

3. Export.gov is designed to assist U.S. businesses find all U.S. Federal Government export-related information in one, user-friendly Web site. By providing all country, industry, and program information at a central location, Export.gov enables users to answer their questions quickly without having to understand the organizational structure of the U.S. Government.

Export.gov Web site

[Export.gov](http://www.export.gov) is a multi-agency trade portal that brings together U.S. Government export-related information under one easy-to-use web site, organized according to the intended needs of exporters, especially small businesses. Whether a company is exploring the possibility of exporting, searching for trade partners, seeking information on new markets, or dealing with trade problems, this web site can help. Additionally, the site has easy links to information on advocacy, trade events, trade statistics, tariffs and taxes, market research, export documentation, financing export transactions, and much more. For more information, visit the Web site at: <http://www.export.gov>.

TRADE DEVELOPMENT⁸

ITA's Trade Development (TD) unit is the Commerce Department's link to U.S. industry. TD provides industry and market analysis, export promotion services, advocacy for U.S. companies bidding on foreign government contracts, and support for trade negotiations. TD offers an array of services to help small businesses increase their export potential.

4. More about TD, including information on its services and industry analysts' contact information, is available at <http://www.trade.gov/td>.

Industry Expertise

TD's industry expertise encompasses the majority of U.S. business sectors.⁹ Industry sector specialists provide U.S. firms with: information and analysis of domestic and foreign industry trends; foreign market conditions and opportunities for specific products or services; information on foreign market tariffs and non-tariff barriers and regulations; advocacy assistance; business and cultural practices; and advice on business and cultural practices.

Trade Negotiations and Agreements

TD's industry expertise is the primary source used in trade negotiations by the President of the United States and the Office of the U.S. Trade Representative (USTR). TD's close interaction with industry, understanding of restrictions on market access, product standards and testing requirements, and knowledge of trade data assist negotiators in the drafting of trade agreements with maximum benefits for U.S. firms. Additionally, TD industry experts help monitor and enforce foreign governments' compliance with trade commitments through collaboration with other ITA units, including the US&FCS and Market Access and Compliance (MAC) regional desk officers, as well as the USTR.

TD's INFORMATION TECHNOLOGY INDUSTRIES

TD's Deputy Assistant Secretary for Information Technology Industries oversees the activities of the four (4) high-tech

industry-focused offices: Office of Information Technologies (OIT); Office of Telecommunications Technologies (OTT); Office of Electronic Commerce (OEC); and the Office of Microelectronics, Medical Equipment, and Instrumentation (OMMI).

Office of Information Technologies

OIT focuses on the following IT industry segments: computers and peripherals; software; networking equipment; Internet technologies; and e-commerce technologies.

OIT actively supports U.S. IT firms' efforts to expand their business overseas. OIT industry specialists track the growth and competitiveness of domestic and foreign IT industries; counsel U.S. businesses on overseas market conditions and the practical aspects of exporting their products; identify market barriers as they affect IT exports; and work closely with USTR to negotiate the removal of such barriers.

OIT export promotion activities include trade missions, trade fairs, catalog shows, and technical seminars that introduce U.S. businesses to end-users and potential trading partners located overseas.

OIT staff compile and disseminate detailed information and analyses on the IT industry sectors they cover and contribute to the annual Department of Commerce *U.S. Industry & Trade Outlook* publication that describes current and future IT industry and market trends on a domestic and global basis. These specialists also work to update and expand the OIT Web site with information on foreign markets and regulations, including tariff and tax rates for IT products, U.S. and foreign policies that affect IT exports, upcoming trade events,

5. The agricultural sector falls within the purview of the U.S. Department of Agriculture

and additional government and private sector resources. OIT distributes a free electronic newsletter highlighting trade leads, partnering opportunities, and trade events.

To obtain more information, including OIT international trade specialists and the regions/industry sectors they cover, contact:

Office of Information Technologies (OIT)
U.S. Department of Commerce, Room 2806
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-0571
FAX: (202) 482-0952
Internet: <http://ExportIT.ita.doc.gov>

Office of Telecommunications Technologies

OTT's mission is to support the growth and competitiveness of the U.S. telecommunications equipment and services industries in foreign markets.

OTT provides business counseling to U.S. telecommunications firms seeking to enter or expand in specific markets by developing and disseminating information on the telecommunications market in foreign countries based upon information from US&FCS and a wide range of other industry resources¹⁰.

OTT promotes international trade and investment opportunities for the U.S. telecommunications industry by sponsoring events that offer direct contact with foreign government and industry officials. OTT, in

conjunction with sister ITA units and government agencies, acts as an intermediary between U.S. firms and foreign governments to provide advocacy on behalf of U.S. companies bidding on public projects abroad. OTT supports the USTR in trade negotiations to open foreign markets for U.S. telecommunications equipment and services exports. Additionally, OTT monitors both bilateral and multilateral telecommunications agreements and provides input to the USTR regarding compliance by foreign countries.

OTT conducts market research and statistical analysis of the domestic and international telecommunications industry and posts a variety of industry information to its Web site. The office distributes complimentary electronic newsletters that deliver up-to-date information on foreign market opportunities and changes affecting the industry and OTT contributes the telecommunications chapters featured in the Department of Commerce *U.S. Industry & Trade Outlook* publication.

To obtain more information, including OTT international trade specialists and the regions/industry sectors they cover, contact:

Office of Telecommunications Technologies (OTT)
U.S. Department of Commerce, Room 4324
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-4466
FAX: (202) 482-5834
Internet: <http://telecom.ita.doc.gov>

Office of Electronic Commerce (OEC)

The Office of Electronic Commerce is responsible for expanding U.S. exports by

6. See description of the U.S.&FCS that follows in this chapter.

bringing small business exporters into the global economy, as well as engaging U.S. trading partners in e-commerce issues. The focus is to connect U.S. businesses to the new digital economy.

OEC provides information, business counseling, and export assistance services to U.S. firms seeking to enter specific markets by developing and disseminating information on the electronic commerce market conditions in foreign countries. OEC provides general trade and policy analysis and research, including analyzing foreign countries' e-commerce laws and initiatives. IT compared such requirements to U.S. policy requirements as well as other policy developments in relevant international fora.

OEC participates in fostering a favorable policy environment by focusing on keeping both the Internet and foreign markets open to private sector driven global growth. This is accomplished by participating in various fora, such as the U.S. Government's interagency working group on electronic commerce, the OECD, WTO, European Union, Asia Pacific Economic Cooperation forum (APEC) and Free Trade Agreement of the Americas (FTAA). This effort also includes overseeing the Administration's E-Commerce Joint Statements with other governments, managing the IFAC-4 E-Commerce advisory committee, as well as participating in formal as well as informal policy dialogues with other nations. OEC's task is to determine how to address the changes taking place and ensure that the policy infrastructure is in place to enable business, trade and investment to occur as efficiently as possible in the digital economy. OEC also provides various types of technical assistance, such as video conferences, to bring together government

policy and industry experts on various e-commerce issues.

To obtain more information, including OEC international trade specialists and the regions/industry sectors they cover, contact:

Office of E-Commerce (OEC)
U.S. Department of Commerce, Room 2003
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-0216
FAX: (202) 482-501-2548
Internet: <http://www.ecommerce.gov>

Office of Microelectronics, Medical Equipment, and Instrumentation (OMMI)

OMMI covers electronic components such as electron tubes, printed circuit boards, semiconductors, capacitors, resistors, transformers, and connectors, as well as semiconductor manufacturing equipment. Additionally, OMMI supports several industry sectors with high IT content, including medical and dental equipment and electro medical apparatus, process control instruments, laboratory analytical instruments, optical instruments, and instruments used to measure electricity and electrical signals.

OMMI's primary mission is to promote exports and increase the international competitiveness of U.S. industry working in these sectors. OMMI counsels U.S. firms on foreign market conditions and the specifics of exporting, using information from overseas US&FCS offices and a wide range of industry-related resources. OMMI staff work with private sector and Department of Commerce colleagues to develop trade missions, trade fairs, catalog

shows, seminars, and other trade events that offer direct contact with foreign government officials, industry representatives, and end-users. In cooperation with other parts of ITA and U.S. government agencies, OMMI participates in trade negotiations and supports USTR efforts to eliminate or reduce regulatory and other types of barriers that hinder trade and investment in these industries.

OMMI staff gathers and disseminates market research and statistical analyses of the domestic and international microelectronics, medical equipment and instrumentation industries. Trade and industry reports, trade statistics, information on foreign markets and regulations, U.S. and foreign policies that affect exports, trade events, and links to additional government and private sector resources are available on the OMMI Web site. OMMI industry specialists profile current and future industry and market trends on a domestic and global basis in the Department of Commerce *U.S. Industry & Trade Outlook* publication.

To obtain more information, including OMMI international trade specialists and the regions/industry sectors they cover, contact:

Office of Microelectronics, Medical Equipment, and Instrumentation (OMMI)
U.S. Department of Commerce, Room 1015
14th Street & Constitution Avenue, N.W.
Washington, DC 20230
Tel: (202) 482-2470
FAX: (202) 482-0975
Internet: <http://www.trade.gov/ommi>

OTHER TRADE DEVELOPMENT OFFICES AND PROGRAMS

Trade Information Center

TD's Trade Information Center (TIC) is an excellent first stop for new-to-export companies seeking export assistance from the federal government. TIC Trade Specialists: 1) advise exporters on how to find and use government programs; 2) guide businesses through the export process; 3) provide country and regional business counseling, foreign import tariff/tax rates and customs procedures, trade opportunities and best prospects for U.S. companies, distribution channels, standards, and common commercial difficulties; 4) provide information on domestic and overseas trade events; and 5) provide sources of public and private sector export financing. TIC trade specialists also assist exporters in accessing reports and statistics from the computerized National Trade Data Bank and direct them to state and local trade organizations that provide export assistance. To contact the TIC, call 1-800-USA-TRADE; FAX (202) 482-4473; e-mail: TIC@ita.doc.gov; or visit the Web site <http://tradeinfo.doc.gov>.

Advocacy Center

The Advocacy Center (AC) aims to ensure that U.S. companies of all sizes are treated fairly and evaluated on the technical and commercial merits of their proposals for foreign government tenders. Advocacy assistance is wide and varied, but often involves U.S. companies that must deal with foreign governments or government-owned corporations. Assistance can include the visit of a high-ranking U.S. government official to a key foreign official; direct

support by U.S. officials (including Commerce and State Department officers) stationed overseas at the U.S. Embassies and Consulates; or, coordinated action by U.S. government agencies to provide maximum assistance. The AC is at the core of the President's National Export Strategy and its goal to ensure opportunities for American companies. Since its creation in 1993, the AC has helped hundreds of U.S. companies in various industry sectors win foreign government contracts valued at more than \$2.5 billion. For more information, visit the AC's Web site:

<http://www.trade.gov/advocacy>.

Trade Missions And Events

Working in coordination with the private sector and the US&FCS, TD industry analysts help plan, organize, and execute trade events, including high-level executive missions with the Secretary or Under Secretary of Commerce. Additionally, there are a host of trade conferences and shows

held throughout the U.S. and abroad. Industry-specific trade missions and events are listed on the individual TD offices' Web sites⁷.

Small Business Program

ITA's Small Business Program is the focal point for trade policy issues concerning SMEs. The program brings the small business point of view to international trade policy discussions, primarily through the Industry Sector Advisory Committees

(ISAC) on Small and Minority Business for Trade Policy Matters (ISAC 14), the only advisory committee to the U.S. Government on small and minority business export concerns⁸. The Small Business Program also provides outreach to and plans events for small, women-owned, and minority-owned firms. Additional information can be found on the Industry Consultations Program's Web site at <http://www.trade.gov/td/icp>, or by contacting the Industry Consultations Program, U.S. Department of Commerce, tel: 202-482-3268; FAX: 202-482-4452; e-mail: Trade_Advisory_Center@ita.doc.gov.

Industry Consultations Program

Industry has a voice in U.S. trade policy formulation through the Industry Consultations Program (ICP). The ICP includes more than 500 members and is comprised of seventeen (17) Industry Sector Advisory Committees (ISACs) on Trade Policy Matters and three (3) Industry Functional Committees on Trade Policy Matters (IFACs). The ISACs represent industry sectors of the U.S. economy, including IT and small and minority businesses. The IFACs address crosscutting issues affecting all industry sectors - customs, standards, intellectual property rights, and e-commerce. Advisors on these committees have direct access to trade policymakers at the Department of Commerce and the USTR and help develop their industry's positions on U.S. trade policy and negotiation objectives. Additional information can be found on the ICP's Web site at <http://www.trade.gov/td/icp>, or by

7. A searchable list of trade events is available through the US&FCS' website at <http://www.usatrade.gov>.

8. See "Industry Consultations Program" section that follows.

contacting the Industry Consultations Program, U.S. Department of Commerce, tel: 202-482-3268; FAX: 202-482-4452; e-mail: Trade_Advisory_Center@ita.doc.gov.

Export Trading Companies and Trade Intermediaries

The Office of Export Trading Company Affairs (OETCA) promotes the formation and use of export trade intermediaries and the development of long-term joint export ventures by U.S. firms. OETCA administers two programs available to all U.S. exporters. The Export Trade Certificate of Review Program provides antitrust protection to U.S. firms for collaborative export activities. The MyExports.com™ program is designed to help U.S. producers find export partners and locate export companies, freight forwarders, and other service firms that can facilitate export business. For more information, visit <http://www.trade.gov/oetca> and <http://www.myexports.com>.

Market Development Cooperator Program

MDCP is a competitive matching grants program that builds public-private partnerships by providing federal assistance to nonprofit export multipliers such as states, trade associations, chambers of commerce, world trade centers, and small business development centers. These multipliers are particularly effective in reaching and assisting SMEs. Applicants use their own creativity to design projects that will help SMEs to enter, expand, or maintain market share in targeted overseas markets. MDCP awards help underwrite the start-up costs of exciting new export marketing ventures which these groups are often

reluctant to undertake without federal government support. For more information, visit <http://www.trade.gov/mdcp>.

THE U.S. COMMERCIAL SERVICE (US&FCS)

The US&FCS, one of TD's sister units in ITA, aims to assist U.S. firms in realizing their export potential by providing: 1) exporting advice; 2) information on overseas markets; 3) assistance in identifying international trading partners; 4) support of trade events; and 5) advocacy, among other services. US&FCS trade specialists work in more than 100 Export Assistance Centers across the United States and in more than 150 overseas posts, in approximately 80 foreign countries, which combined represent more than 96 percent of the world market for exports.

International Operations

Overseas US&FCS offices are housed in U.S. Embassies and Consulates and serve as intermediaries to foreign markets. US&FCS staff members are industry-focused and offer numerous products and services that assist U.S. companies enter or expand their sales in a particular market. The main activities of these offices include establishing key industry and foreign government contacts, helping match U.S. suppliers with local buyers, and organizing or facilitating trade events. Contact information for US&FCS trade specialists who cover the IT, telecommunications, and e-commerce sectors in Mexico is listed in the Appendix of this report.

Domestic Operations

The US&FCS provides export counseling and marketing assistance to the U.S. business community through its 1,800 trade experts working in more than 100 domestic Export Assistance Centers (USEACs) located across the country. USEAC staff coordinate work closely with their US&FCS colleagues stationed overseas to match U.S. suppliers with foreign buyers. USEACs help firms enter new markets and increase market share by identifying the best markets for their products and services, and developing an effective market entry strategy informed by input generated in the overseas offices. They also advise clients on practical exporting matters such as distribution channels, programs and services, and relevant trade shows and missions, as well as assisting with trade finance programs available through federal, state, and local entities.

US&FCS Services

Market Research

Industry Sector Analysis (ISA)

ISAs are structured market research reports produced on location in leading overseas markets and cover market size and outlook, with competitive and end-user analysis for the selected industry sector. ISAs are available through the U.S. Commercial Service's Web site <http://www.usatrade.gov>) and are a component of the National Trade Data Bank (NTDB) subscription service detailed below.

International Marketing Insight (IMI)

IMIs are written by overseas and multilateral development bank staff and cover information on the dynamics of a particular industry sector in one foreign market. IMIs are available through the U.S. Commercial Service's Web site (<http://www.usatrade.gov>) and are a component of the NTDB subscription service detailed below.

Country Commercial Guide (CCG)

CCGs are prepared annually by U.S. Embassy staff and contain information on the business and economic situation of foreign countries and the political climate as it affects U.S. business. Each CCG contains the same chapters, covering topics such as marketing U.S. products, foreign trade regulations and standards, investment climate, business travel, and in-country contact information. CCGs are available through the U.S. Commercial Service's Web site (<http://www.usatrade.gov>) and are also a component of the NTDB subscription service noted below.

National Trade Data Bank (NTDB)

The U.S. Commercial Service contributes to the NTDB, a one-stop source of international documents, including market research reports, trade leads and contacts, statistical trade data collected by federal agencies that contains more than 200,000 trade-related information, and Country Commercial Guides. The NTDB subscription may be purchased on CD-ROM, accessed through the Internet (<http://www.stat-usa.gov>), or is accessible free of charge at federal depository libraries.

Call 1-800-STAT-USA for more information and ordering instructions.

Export Prospects

Platinum Key Service

The Platinum Key offers customized, long-term assistance to U.S. companies seeking to enter a new market, win a contract, lower a trade barrier, or resolve complex issues. Fees depend on the scope of work. The U.S. Commercial Service in Mexico City has prepared a customized platinum key program which is highlighted on the following page.

Flexible Market Research (FMR)

FMR provides customized responses to questions and issues related to a client's product or service. Available on a quick turnaround basis, the research addresses overall marketability of the product, key competitors, price of comparable products, customary distribution and promotion practices, trade barriers, potential business partners, and more. Fees vary according to scope of work.

International Partner Search (IPS)

IPS provides a customized search that helps identify well-matched agents, distributors, licensees and strategic alliance partners. A fee of \$600 per country is charged.

International Company Profile (ICP)

ICP investigates the reputation, reliability, and financial status of a prospective trading partner. A U.S. exporter can obtain this information, as well as detailed answers to specific questions about the prospective

partner, in a confidential report. In addition, commercial officers at the U.S. Embassy will provide a recommendation on the suitability of the profiled company as a business partner. A fee of \$500 per company is charged.

Export Promotion

International Buyer Program (IBP)

IBP, supporting 28 major domestic trade exhibitions annually, undertakes for each show a worldwide promotional campaign aimed at maximizing international attendance through work with the overseas network of Commercial Service and Embassy offices. Qualified buyers and prospective distributors, many brought as part of delegations led by overseas commercial staff, are assisted in meeting with interested exhibiting firms and provided services aimed at helping them find new suppliers and trade partners. Each show features an international business center at which export counseling, matchmaking, interpreter and other business services are provided to international visitors and exhibitors.

Video Conferencing Programs

The "Virtual Matchmaker," "Video Gold Key," and "Video Market Briefing" programs provide an effective tool to help U.S. companies assess an overseas market or overseas business contacts before venturing abroad to close a deal. Companies can use these cost-effective video services to interview international contacts, get a briefing from overseas industry specialists on prospects and opportunities, or develop a customized solution to international business needs.

Gold Key Service

The Gold Key is a custom-tailored service for U.S. firms planning to visit a country. This service provides assistance in developing a sound market strategy, orientation briefings, introductions to pre-screened potential partners, interpreters for meetings, and effective follow-up planning. The fees range from \$150 to \$700 (for the first day) per country.

Matchmaker Trade Delegations

The Matchmaker Trade Delegation Program is designed to match small to medium-sized new-to-market or new-to-export U.S. firms with qualified business contacts abroad. Each mission targets major markets in two or three countries that have strong potential for U.S. goods and services. Delegation members travel to each country and benefit from export counseling, interpreter service and logistics support, market research, in-depth market briefings, and a personalized itinerary of business appointments screened by commercial specialists at U.S. Embassies and Consulates

BuyUSA.com

BuyUSA.com (<http://www.buyusa.com>) is a unique public/private partnership between the U.S. Commercial Service and IBM. It established a one-stop international marketplace for U.S. small to medium-sized enterprises to identify potential international partners and transact business on-line. The BuyUSA.com e-marketplace includes managed/targeted trade leads, on-line,

Platinum Key Service in Mexico

The U.S. Commercial Service in Mexico City now offers a flexible market entry service specifically targeted towards information technology and telecommunications companies interested in breaking into or expanding their sales in Mexico. This service is available to companies in the following areas of business:

- Internet/Intranet/Extranet
- Electronic commerce
- ISP/ASP & web hosting services and infrastructure
- Information Technology
- Computer Technology
- Mobile computing
- Software development
- Telecommunications Equipment and Services

The fee for the basic package is \$2,500. The basic package can be modified depending upon a company's specific requirements. The basic Platinum Key Service for IT and Telecommunications Companies includes:

- Pre-assessment service
- Workshop "How to do Business in the Mexico Internet & IT Industry"
- Private consulting and business strategy development service
- Matchmaking service and one-on-one appointments in Mexico
- Additional services available

If you are interested in the Platinum Key Service for IT & Telecommunications Companies, please contact:

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Tel.: 011-52-55-5140-2634
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catalogs, automated searching and sourcing, financing, logistics, currency conversion, due diligence, landed-cost calculation, and tariff and duty calculation. BuyUSA.com is the only Web site of its kind to combine an on-line interface with a worldwide network of one-on-one trade counselors.

sector partner, ABP International, to promote U.S. products and services to more than 400,000 potential buyers and partners in 145 countries.

Product Literature Centers

This program showcases U.S. company product literature through exhibits in international trade shows held in both mature and emerging markets. The Product Literature Center is a low cost, efficient way for small and medium-sized firms to get worldwide sales leads in their particular industry. A Commerce Department industry/international specialist or the U.S. Embassy operates Product Literature Centers. Visitors to Product Literature Centers are required to register and may take company literature with them. All sales leads are sent directly to the Product Literature Center participant.

Multi-State Catalog Exhibitions Program

This program showcases U.S. company product literature in fast-growing markets within a geographic region. The U.S. Department of Commerce and representatives from state development agencies present product literature to hundreds of interested business prospects abroad and send the trade leads directly to U.S. participants.

Commercial News USA (CNUSA)

CNUSA, a catalog-magazine containing advertisements of U.S. products, is published 12 times per year by the Commercial Service through its private-

APPENDICES

COFETEL BIOGRAPHIES

The biographies of the four (4) individuals that make up COFETEL's new leadership follow:

JORGE ARREDONDO MARTINEZ **Chairman**

Mr. Arredondo Martinez has worked in the IT and telecommunications industry for the past 36 years in Mexico and abroad, with companies such as Axtel, IBM, Litton Industries, and Ericsson. He started with a degree in telecommunications and electronic engineering, and his subsequent career in research & development, manufacturing, marketing, public affairs and policy development has given him a very broad understanding of the key technological, commercial, and regulatory issues in the industry. Since the 1980s, Mr. Arredondo has been closely involved in the development of Mexico's telecommunications infrastructure, and the state-of-the-art IT systems and technologies that have enabled new generations of fixed and mobile communication services. As Mexico's telecommunications sector was privatized, Mr. Arredondo pioneered market research and consulting work for companies in the industry, both on his own and in partnership with well-known specialized firms. As President and founder of i-expertus, the consulting group he formed in 1994, his work for the last four years has been largely focused on telecommunications policy development and the formation of the Regulatory Planning Department at Axtel, a Mexican local and long distance service provider. Born in 1940 in Mexico City, Mr. Arredondo has a Telecommunications and Electronics Engineering degree from the National Polytechnic Institute in Mexico

City, as well as a Diploma from the University of Liège, Belgium, for postgraduate work in computer applications to industrial process control. He is an alumnus of the International Institute for Management Development (IMD), in Lausanne, Switzerland, and has occupied honorary positions at various engineering institutes and associations.

ABEL MAURO HIBERT SANCHEZ **Economic Commissioner**

Mr. Hibert Sanchez has worked as a financial and telecommunications analyst. He has been involved in several positions in the public and private sectors. He worked as a researcher for Telmex, was economic consulting director in CIMEX-WEFA, and macroeconomic projections manager in Macro Asesoria Economica, a subsidiary of Operadora de Bolsa. He was Chief of Department of the President, building macroeconomic models from 1985 to 1987. Hibert has a Master in Economics from Instituto Tecnológico y de Estudios Superiores de Monterrey.

GERARDO SORIA GUTIERREZ **Legal Commissioner**

Mr. Soria Gutierrez has represented Mexican and foreign telecommunications companies working in the local, long distance, satellite, television, value added services, and wireless telephony sectors. He has participated in important mergers and acquisitions in the telecommunications industry in Mexico and South America. Mr. Soria has assessed and represented telephone companies in interconnection negotiations, proportional traffic exchange, and international settlement with the main U.S. long distance carriers. Mr. Soria has a degree in law from the Universidad Iberoamericana. He is a member of the

Telecommunications Laws Commission
(Barra Mexicana del Colegio de Abogados)
and is a practicing partner at Frank, Galicia,
and Robles law firm.

JOSE LUIS MUNOZ BALVANERA

Technical Commissioner

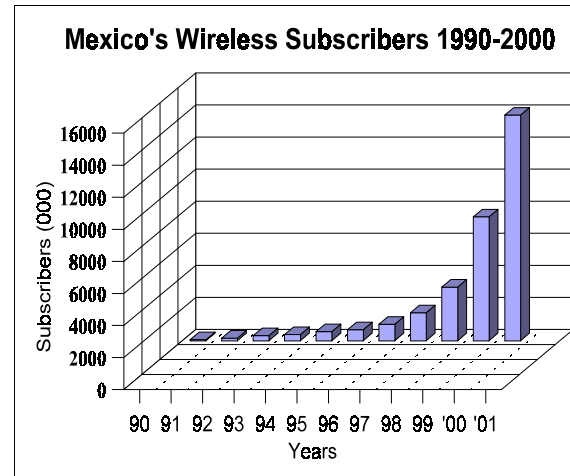
Mr. Muñoz Balvanera has more than 30 years of experience in the planning, development, and operation of telephone networks. Mr. Muñoz has participated in the modernization and digitalization of the telephone network and helped develop the regulatory and operating processes of interconnection that increased market competition. In the international arena, he participated in planning, developing, and modernizing the wireline and wireless telephone network of Telgua (84 percent owned by Telmex) in Guatemala and led several bidding processes to acquire telephone companies in Central America. Mr. Muñoz has held several management positions at Telmex. He is an engineer from Universidad Nacional Autonoma de Mexico.

Background on Mexico's Wireless Development

One of the earliest actions taken by the Government of Mexico (GOM) to prepare for a competitive telecom sector (in addition to privatizing Telmex) occurred in 1989, when cellular telephone services were first authorized. Generally following the U.S. licensing model, in the early 1990s the Secretariat of Communications and Transportation (SCT) issued ten concessions for cellular telephone services to private sector competitors, one nationwide license and nine regional licenses. At the time the government assigned two bandwidths to each of the nine regions: Band A, extending from 800 to 850 MHz, and Band B, extending from 850 to 900 MHz. Band B was monopolized by Telcel.

The early development of wireless networks differed by region according to such factors as level of economic development, income distribution, cost of entry, pricing packages, free market orientation, and effectiveness of distribution systems. In the earliest phases, cellular carriers focused mainly on major urban areas linked along interstate highways.

U.S. wireless services and equipment suppliers were significant players during Mexico's early wireless development. Private operating consortia in all nine regions had U.S. participation, including firms such as Bell Atlantic (now Verizon), McCaw (now AT&T Wireless), Motorola, Centel, Millicom, General Cellular, and Associated Communications. Motorola had a significant presence, holding a 40 percent stake in Cedetel (Region 4), a 42 percent stake in Baja Celular Mexicana (Region 1),



Source: COFETEL

and was positioned as a major competitor to IUSACELL and Telcel.

The following are some of the more noteworthy events in Mexico's early wireless development:

- By 1993, U.S.-Mexico cross-border roaming agreements were in place which allowed wireless users to place and receive calls outside their home service areas. This service was available under a Telcel and Southwestern Bell arrangement that allows customers to roam cross-border between southern Texas and northern Mexico. U.S. West Cellular also formed partnerships with Mexican cellular operators to provide cross-border roaming in Mexico City, Monterrey, Guadalajara, and other cities.

- In 1994, the U.S. and Mexico signed six protocols for wireless telecommunications services and reached agreement on frequency allocation for land mobile radio communications services in the border region. The protocols cover the allocation and use of channels in the 220-222 MHz, 470-512 MHz, 806-824 MHz, 851-869 MHz, 896-901 MHz, and 935-940 MHz ranges for land mobile radio services along the shared U.S.-Mexico border. Other protocols addressed conditions for air-to-ground services, cellular roaming services, and point-to-multipoint radio communications in the border region.
- By 1995, wireless services represented more than 10 percent of the country's overall telecommunications services market, up from 5 percent in 1993. Competition had taken root--there were two viable operators in every region-- and subscriber numbers were growing exponentially. In Mexico City, the largest urban market, the combined subscriber base exceeded 300,000, with the market roughly split between the two providers Telcel and IUSACELL. Network investment continued; despite the Peso Crisis of 1995, network expansion requirements were such that Telcel invested \$35 million in Mexico City alone.
- In 1996, the Mexican government auctioned additional paging, point-to-point links and mobile aeronautical frequencies for private sector development. By 1997, the Secretariat of Communications and Transportation (SCT) divided the country into 62 "Basic Service Areas" (Areas Basicas de Servicio, ABS), which were, in turn, grouped into the original service regions created in 1989. Basically, each ABS includes a set of towns or cities with economic links or similar topography. The SCT also further defined frequencies according to intended use to prepare for further spectrum auctions.
- In 1997-98, over the course of about seven months, COFETEL aggressively moved to auction spectrum, introduce competition in new sectors and license new technologies. The auctioning of PCS licenses in nine regions of Mexico was completed in May 1998. COFETEL auctioned spectrum in each of the nine regions for PCS and WLL--two 30 MHz (Bands A and B) and two 10 MHz licenses (Bands D and E) at 1.8 GHz-1.9 GHz license plus two 50 MHz at 3.4 GHz licenses--were auctioned. An estimated \$1.2 billion was raised. Telcel was awarded the B and D bands in all nine regions in Mexico. PCS licenses were awarded to Pegaso PCS and Unefon.
- By 1998, code division multiple access (CDMA) technology was being used in all nine regions. Sony and QAULCOMM expanded their joint venture to include the manufacture of CDMA phones in Sony's Mexico facility. Telcel contracted with Ericsson to build the

Information Technology Industries, April 2002

country's first 1900 MHz wireless communications network and to expand Telcel's 800 MHz network.

PROFILE OF ORIGINAL LICENSE HOLDERS

Region	Concession Holder	Team Members
1	Baja Celular Mexicana	TECELMEX, General Cellular, and Motorola
2	Movitel del Noreste	Baja Celular/Motorola, GTE/McCaw, and Contel
3	Telefonia Celular del Norte (Norcel)	J.G. Calderón, Motorola, Centel (Sprint)
4	Celular de Telefonía (CedeTel)	Protexa, Millicom, Motorola
5	Comunicaciones Celular del Occidente (COMCEL) - IUSACELL	IUSACELL (formerly owned by Hermes, Banamex, Calzado Canada, BellSouth, and Vodaphone)
6	Sistemas Telefónicos Portátiles (Portacel)	IUSACELL (formerly owned by Alcatel & Bell Canada)
7	Telecomunicaciones del Golfo (Telcom)	IUSACELL (formerly owned by Grupo Industrio de Desarrollo, Industrias Unidas, and Bell Canada)
8	Portatel del Sureste	Luís Niño de Rivera, Associated Communications Corporation
9	IUSACELL	IUSACELL, Bell Atlantic
1-9	Telcel (Teléfonos de Mexico) - Band-B	Grupo Carso, SBC Corp., France Telecom

Source: U.S. Department of Commerce, Office of Telecommunications Technologies

Wireless Operators in Mexico (2001)

The following major networks currently provide wireless services to Mexico's nine service regions:

Operator	Launch	Ownership	Coverage	Standard	Equipment	Subscribers (June 01)
Telcel	1990	America Movil	National	AMPS/ TDMA/ GSM	Ericsson	13,186,000
Iusacell	1990	Verizon Vodafone	Regional	AMPS	Ericsson, Alcatel	220,000
Iusacell	1998	Verizon Vodafone	Regional	CDMA	QAULCOMM	1,422,420
Baja Celular	1990	Telefonica	Regional (North)	AMPS/ CDMA	Motorola	179,000
Movitel del Noroeste	1990	Telefonica	Regional (North)	AMPS/ CDMA	Motorola	254,000
Norcel	1990	Telefonica	Regional (North)	AMPS/ CDMA	Motorola	180,000
Cedetel	1990	Telefonica	Regional (North)	AMPS	Motorola	452,000
Portatel del Sureste	1990	Telefonica	Regional	AMPS	Motorola	336,000
Pegaso	1999	Telefonica	Regional	CDMA 1900	QAULCOMM / Ericsson/ Alcatel	1,500,000
Unefon	2000	TV Azteca and local Shareholders	Regional (South)	CDMA 1900	Nortel Networks	467,000

Source: World Markets Research Centre and U.S. Department of Commerce, Office of Telecommunications Technologies

Useful Contacts in the United States and Mexico

United States

U.S. Department of Commerce, International Trade Administration Trade Development

Office of Telecommunications Technologies (OTT)

Steve Green

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Telecommunications Industry Association (TIA)

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Jeffrey Nelson, Communications Director
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Personal Communications Industry Association (PCIA)

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Selected Major IT and Telecommunications Trade Events in Mexico

EXPO COMM MEXICO 2002

February 12-15, 2002

Mexico City, Mexico

<http://www.expocomm.com.mx>

Event Organizer: E.J. Krause & Associates, Inc.

Ever since its first edition in 1992, Expo COMM Mexico has exhibited both the latest and breakthrough technologies. The show provides opportunities for users, investors and telecom systems operators to have access to a wide range of high-quality solutions at lower-than-ever prices. This 11th international telecommunications, wireless, and broadband technology exhibition and conference for Mexico and Central America continues to attract top level business people. Expo Comm Mexico attracts more than 28,000 visitors and 350 exhibitors from approximately 20 countries.

SOFTWORLD – ACCOUNTING & FINANCE

April 24-25, 2002

<http://www.softworld.com>

COMDEX MEXICO 2002

May 28-31, 2002

<http://www.comdex.com.mx>

Event Organizer: E.J. Krause & Associates, Inc.

COMDEX is the most relevant event in Mexico within the field of information technology, bringing together the most important vendors in the field. COMDEX Mexico 2002 will be focused on offering solutions for business application technologies. Such an event is highly relevant for all companies, especially the medium and small businesses that rarely have access to a pool of systems consultants ready to guide them. All business owners and officials that visit the exhibition floor at COMDEX are able to see, first hand and before anyone else, the latest and most appropriate technologies that the field has for their businesses.

GOBIERNO MEXICO 2002

September 10-12, 2002

Mexico City, Mexico

<http://www.tradex.com.mx>

Event Organizers: E.J. Krause & Associates, Inc. & Tradex Exposiciones Internacionales, S.C.

An information technology and telecom show aimed at all levels of government: federal, state, and local, as well as government agencies. Exhibitors are all IT and telecom product and service providers with programs that focus on government solutions. Visitors: All levels of government decision makers, both technical and non-technical. About 100 exhibitors and more than 4,000 visitors are expected.

EXPO COMM/ine-B MEXICO NORTE 2002

October 29-31, 2002

Monterrey, Mexico

<http://www.expocomm.com/latin/mexiconorte.html>

Event Organizer: E.J. Krause & Associates, Inc.

The 6th presentation of Northern Mexico's leading telecommunications, networking and e-commerce exhibition. The world's leading telecommunications trade show series combines forces with ine-B to bring Northern Mexico's explosive industry the full spectrum of products and services for telecommunications, networking and e-commerce. More than 200 exhibitors (including those who share booths) and approximately 5,000 visitors are expected.

EXPO COMM MEXICO 2003

February 18-21, 2003

Mexico City, Mexico

<http://www.expocomm.com.mx>

Additional Information on Trade Agreements

For Information on the North American Free Trade Agreement contact:

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